RECONCEPTUALIZING THE INDIVIDUAL: AN ECOLOGICAL APPROACH

By

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The purpose of this study is to develop a clear and coherent concept of the individual. An ecological concept of the individual is based on the activities of common sense experience instead of theoretical abstractions. The individual is conceived as a goal-directed, living organism who acts according to environmental information and a mature emotional and motivational orientation. Only disruptions of this normal mode of functioning suggest that autonomy and sociability are incompatible and that alienation and conflict are necessary. By conceptualizing the individual according to a full range of activities and developmental levels this study accounts for the basis of traditional errors in biased rather than unambiguously false interpretations of qualitative experience.

Conceptual confusion is the result of basing concepts of the individual on abstract modes of experience and primitive levels of development. The implication is that an individual must be either autonomous or sociable. That is to say, one is either unsociable

and self-determined or sociable and determined by others. The abstract psychological principles of both approaches exhibit incoherent implications. This study shows that a coherent concept of the individual must include various modes of experience and activity as well as a full range of developmental levels. From this holistic perspective autonomy and sociability are reconceptualized. The individual can thus be conceptualized coherently. Autonomy and sociability may therefore functionally complement one another. From the ecological perspective autonomy emerges from well-developed interpersonal or social relations.

This study explores the problem with some historical perspective. René Descartes' rationalist concept of autonomy and David Hume's empiricist concept of sociability provide incompatible concepts of the individual. The cognitive as well as the emotional and motivational theories of both are examined and evaluated from the perspective of more adequate ecological and developmental theories. Rationalist and empiricist cognitive theories are evaluated according to James J. Gibson's ecological concept of the cognitive system and corresponding theories of emotion and motivation are evaluated in terms of recent interpretations of Freudian psychoanalytic, developmental theory. The individual is consequently reconceptualized in terms of psychoanalytic and ecological concepts. Implications for education are then explained.

CHAPTER 1
INTRODUCTION

The general problem of coherently conceptualizing the individual first occurred to me one day while I was reading about the psychoanalytic concepts of transference and countertransference. In psychoanalytic discourse these concepts are generally used to denote specific interactions between a psychoanalytic analyst or therapist and analysand or patient in the therapeutic situation. Very roughly, transference is a patient's response to the therapist,while countertransference is the therapist's reciprocal response to the patient. Both persons, I was reading, can simultaneously have the same kind of strong, inarticulate, and infantile or early childhood feelings. By interpreting his or her own feelings, the therapist can understand the patient's unconscious thought processes. A therapist must therefore know how to distinguish his or her own feelings from those of the patient. This sort of autonomous self-awareness cannot be taken for granted.

Recognizing the possible difficulty of sorting one's own feelings from those of another, Alice Miller (1981) writes, "Feelings that belong to the countertransference are like a quick flash, a signal, and clearly related to the analysand's person. When they are intense, tormenting, and continuous, they have to do with oneself" (p. 78). The first time I read this passage it reminded me of traditional philosophical proofs of an external world that is distinct from or independent of one's own mental representations and skeptical worries about the possibility of knowing other minds. Something seemed to echo traditional epistemological worries. Perhaps it was because Miller's introspection-based argument supposes that one's own psychological states can be distinguished from those of others by means of the greater intensity, pain, and continuity of one's own. Psychoanalytic writers, however, talk about emotion and motivation, whereas

philosophers are traditionally preoccupied with abstract epistemological problems. Even so, I found the resemblance sufficient to provoke further reflection and began to think that traditional philosophical concepts of mind and individuals might be based on a confusion of affective and cognitive modes of psychological functioning or, perhaps, that theorists have unwittingly transformed personal and social issues into abstract epistemological problems.

Let us consider the content and organization of this chapter. First, I develop an abstract outline of the most fundamental concepts of this study. The aim is to begin delineating various modes of experience or activity, levels of individuation, and corresponding forms of orientation. Although it will take the entire study to clearly account for the meanings of these concepts, an anticipatory schema should help to facilitate understanding. Second, I survey the content and organization of this entire study. The content of each chapter is briefly explored. The aim is to disclose the general logic of individual chapters and how they stand together as a whole. Third is the three-part thesis of this study. Fourth, the concept of diverse modes of lived embodiment must be explored at length and in some detail before the adequate comprehension of the following chapters is possible.

Now Miller's (1981) introspective epistemology of affectivity implies or, at least, strongly suggests the developmental process of individuation. Individuation is one of the two most fundamental principles of psychological functioning that is developed in this study. First, individuation is a process whereby one becomes aware of oneself as a unified individual who is separate from other individuals and objects. The second principle is the functional integrity of perception, action, emotion, and motivation. As these two principles covary, so does one's orientation to oneself and the world. For instance, while perceptual information specifies nothing harmful, one may nonetheless act according to an impulsive or irrational fear. I shall argue in the following study that, first, the impulse is an exclusive function of a lower level of development and, second,

the functional integrity of action, perception, and emotion is disrupted while, third, the individual's connection to the world or ecological orientation is also disrupted. The general and provisional principle is that of covariation among these three. (The purpose of this principle is to facilitate comprehension of this study.)

More elaboration should be helpful. One's mode of experience or one's state of being changes insofar as one is asleep or awake, active or sedentary, in a state of pleasure or pain, happy or miserable, and performing in a clumsy or coordinated manner. An episode of pain, fatigue, emotional distress, or impulsive behavior can disrupt normal or healthy functioning whereby purposeful action can be impeded or paralyzed. One's own problematic condition can thus become the primary object of perception. Impulsive or irrational behavior, for instance, implies the disruption of stable emotional regulation and perceptual control of action. As the process of character development or individuation progresses so does the individual's general disposition toward the integrated functioning of specific modes of activity and therefore the enduring unity of goal-oriented behavior as a whole. *A key point for this study is that the operations of different levels of development and different modes of functioning (or dysfunctioning) imply distinct concepts of action, perception, emotion, and motivation.*

The main objects of criticism for this study are traditional theories that reduce the individual or mind to privileged modes of activity and that privilege the operations or the functions of specific levels of development. By conferring undue privilege to reflective cognition, perception is reduced to detached, immobile, solitary, and passively receptive viewing. Consequently, action and affectivity are considered to be separate or isolated kinds of activity that call for related but independent forms of explanation. The two are frequently taught as separate subjects and can become further isolated as a function of institutional structures. In the following study we shall find that reductive theories of mind or the individual are indirectly based on disruptive or problematic modes of

experience and the activities of lower levels of development. Hence, they tell us very little about healthy functioning in the world of qualitative experience.

Distinct modes of functioning and levels of development also imply very different reductive concepts of autonomy and sociability. The outcome of reductive approaches is incompatible and conflicting concepts of the individual. Traditional or reductive concepts of the individual assume that autonomy and sociability are mutually exclusive modes of being and psychological functioning. The general idea is that one must be either dependent upon and determined by others or independent of others and determined by oneself. *The apparent necessity of this dichotomy emerges from, first, conceptualizing perception and intellectual activity as ontologically distinct or isolated from action and emotional functioning and, second, conceptualizing the mind or individual exclusively according to the operations of lower levels of psychological development or individuation.* This study attempts to show that impeded or problematic modes of experience and the operations of lower levels of development considered alone imply incoherent concepts of the individual.

Now according to this study's reconceptualized account of the individual, *autonomy and sociability are complementary*. The concrete example for this conceptualization is the individual character who operates at an individuated level of functioning. This achievement cannot be taken for granted. Action, perception, emotion, and motivation are functionally integrated insofar as a character has achieved individuation. Action proceeds according to a mature emotional and motivational orientation and is controlled by perceptual information. We shall find that for traditional or reductive concepts of mind as well as for pathological modes of functioning or dysfunctional modes of operation, action may proceed according to inadequate perceptual information and in conformity to an impaired motivational and emotional orientation. I shall characterize such dysfunctional episodes as disruptions of one's common sense orientation or natural attitude. So, instead of reducing the individual to some privileged

mode of experience or activity and to the functions of a privileged level of development, this study aims to conceptualize the individual as a functionally integrated or unified whole. That is to say, the operations of higher and lower levels of development as well as various modes of embodied experience are conceived as a unified whole. The general aim is to develop a coherent concept of an individual who is both autonomous and sociable.

Because the individual will be reconceptualized according to an ecological approach, the term ecological should be defined. In this study ecological implies an organism-environment mutuality with respect to social and physical environments. The operations of an ecologically oriented mind are coordinated with events in the environment. Action is controlled by environmentally specific information, in contrast to physiological and psychological states that do not respond to such information. This study attempts to show how such a sense of mutuality can be impaired in the behavior of individuals and in psychological theories. A key purpose of this study is to show how mutuality can be restored in psychological theory and in the life of the individual.

Let us now survey the content and organization of this study. Chapter 2 explains René Descartes' concept of autonomous intellectual activity and corresponding concept of character psychology or personal autonomy. Descartes' (1641) *Meditations on First Philosophy* is used to account for his theory of autonomous intellectual perception. The goal of the *Meditations* is the discovery and unequivocal grasp of truths that are not vulnerable to the conditions and contingencies of action and experience. The mind or intellect alone can grasp the objects of mathematical cognition and cognitive certainty. Descartes wants unqualified knowledge of principles of the natural world and human behavior. He wants what is infallible. The objects of such cognitive certainty belong to a supposedly perfect world of mathematical concepts. Although the senses and affective responses to the world more or less reliably disclose what is harmful or beneficial to the body, the imperfections of such appearances are ultimately an inferior relative and function of the higher order of existence knowable by the mind alone.

Descartes' (1649) *The Passions of the Soul* explains his account of action and emotion, or moral psychology. Descartes emphasizes the central role of self-esteem or an ongoing sense of well-being that accompanies unimpeded goal-directed action. This particular emphasis is fundamental for my own arguments throughout this study. Humility is the opposite of self-esteem and produces a sense of ill-being or painful self-awareness. Both are evaluative attitudes toward the self that are accompanied by corresponding attitudes or orientation toward the world. Insofar as self-esteem is a principle of action, action is unimpeded and goal-oriented, but insofar as humility displaces self-esteem, action is impeded and the goal-orientation is disrupted. Humility promotes impulsive action. The main obstacle to maintaining self-esteem is separation from and the loss of external goods, or what lies beyond one's control. One must therefore learn to desire only what lies within one's control. Disruptive desires are eliminated or abolished by means of purely intellectual therapy. Normal functioning is restored insofar as desire operates according to the principles of autonomous intellectual functioning. Action, according to Descartes, must proceed according to a top-down, hierarchical structure. This chapter is supplemented by John Cottingham's (1993) *A Descartes Dictionary* and by Marjorie Grene's (1999) article, "Descartes and Skepticism."

In Chapter 2 David Hume's theory of autonomous intellectual functioning inverts the Cartesian hierarchy for a bottom-up approach to conceptualizing the structure of the mind. Although the attitude of immobile and passive viewing is common to both Cartesian and Humean approaches, the bottom-up approach raises serious doubts about the intellect's autonomy. Hume's (1740) *A Treatise of Human Nature* is the main source in this chapter for his cognitive theory and moral philosophy. Hume's (1742) essay, "Of the Standard of Taste" is used to elaborate upon his aesthetic theory and corresponding concept of discernment or attuned perceiving. For Hume, Descartes' perfect world of cognitive certainty is a product of the causally organized objects of imperfect sensory

experience and the constructive power of the imagination. The cognitive certainty of the intellect is an illusion produced by the imagination from the probabilistically conditioned components of experience. The imagination thus functions to ease or sooth anxiety that is produced by the uncertainties of life. The short-term causal relations that constitute sensory experience are the only *objective* basis of the timeless principles and objects of mathematical cognition.

The problem for Hume is that his solitary meditative ego or detached, reflective thinker cannot coherently conceptualize its own operations in terms of its impoverished mode of sedentary experience, and implied form of living, its isolation from the world of coordinated and goal-directed action, as well as interpersonal communication. Hume's own explicit conclusion is that a functionally isolated cognitive system implies both true and false inferences and has no explicit principle to distinguish the two. Hume evaluates the outcome as a source of frustration and despair and then, without further ceremony, proceeds implicitly to integrate the operations of the cognitive system into the wider set of systems. The operations of the cognitive system are integrated with those of the passions or emotional system and those of the body or action system. The cognitive or perceptual, action, and emotional systems are also integrated with the even wider systems of interpersonal communication and interpersonally agreed-upon moral standards. This particular interpretation of the *Treatise* owes a great deal to Annette C. Baier's (1991) *A Progress of the Sentiments*. Hans Jonas' (1960) *The Phenomenon of Life: Toward a Philosophical Biology* is used to conceptualize Hume's concept of emotional functioning and action in organic terms. Jonas plays a smaller role in Chapters 4 and 5.

While both Descartes' and Hume's respective accounts of the emotions and action recognize habit formation as a key principle of development, they disagree about its true basis. Descartes wants to give credit to isolated intellectual processes, whereas Hume trusts experience much more. Descartes is worried about how the separation from and loss of external goods can disrupt one's self-esteem or sense of pride. On the contrary,

Hume sees the wider set of social and physical system not as sources of vulnerability and pain but the basis of self-development, individual power, and pleasure or a sense of well-being. Descartes would prefer to do without other people if he could, whereas Hume cannot do without the love and fellowship of others. Hume's concept of the highly sociable self is criticized for making the individual too much a function of social causes. This chapter is further supplemented by John Baillie's (2000) *Hume on Morality*.

Although Hume's and Descartes' accounts of action and passion *imply* concepts of living, goal-directed, and functionally unified action-and-perception systems that are open to ecological considerations, the cognitive theories of both are too narrowly conceived. Hume's overall approach is better but is not adequate for ecological considerations. The historical result of this kind of debate has been modern psychological theories that reduce the principles of action and perception to the same kind of timeless abstractions or causal relations that are used in the reflective cognition theories of Descartes or Hume. What Chapter 4 aims to provide is an account of the principles of action and perception as they proceed in the world of lived, qualitative experience. This chapter develops a much more sophisticated concept of cognitive individuation. First is an account of the perceptual system and second is an account of the action system. The therapeutic goal of this discussion is to restore psychology and philosophy of mind to the life-world.

In Chapter 4 James J. Gibson's (1979) *The Ecological Approach to Visual Perception* is the most significant source for reconceptualizing the perceptual system, while Gibson's (1966) *The Senses Considered as Perceptual Systems* plays a large supplementary role. William M. Mace (1977) elaborates upon the objective basis of perception. Whereas traditional concepts of perception reduce perception of qualitative objects to awareness of specific modes of sensation, the ecological approach conceives of perception as the direct detection of environmentally and functionally specific information. Exploratory movement or action is essential for detecting the invariant

structures of the environment. The puzzles and paradoxes produced by exclusively stationary viewing disappear from a moving point of observation. Instead of conceiving of change and nonchange as a function of mutually exclusive orders of existence, the ecological approach conceptualizes them as a continuous and complementary whole. Exploratory movement produces change in the perceptual field whereby the detection of information that specifies nonchange or invariant structures is made available for detection. Perception is therefore not reducible to awareness of specific sensory qualities but is an achievement of a living, exploratory organism who detects functional combinations of sensory qualities. Detected information unambiguously specifies the self and the world of qualitative experience as related but distinct. Cognitive individuation is achieved by means of exploratory movement. Robert E. Shaw and John Pittenger (1977, 1978) explain the nature of the highly abstract invariant forms of information that can be detected in the midst of changing stimulation.

Michael T. Turvey (1977) explains the concept of the action system in his essay entitled "Preliminaries to a Theory of Action with Reference to Vision." The essay provides the technical foundation for the action system concept. Turvey's (1990) essay on "Coordination" elaborates on the essence of the earlier (1977) essay. Edward E. Reed (1996) compares and evaluates the traditional reductive or externally regulated motor system concept of action in relation to the ecological alternative or the self-organizing action system in his *Encountering the World.* In his earlier essay, "An Outline of a Theory of Action Systems," Reed (1982) develops the same comparison and critique further. Both accounts help to explain the functional unity of action and perceptual systems in a less technical manner. Gibson's (1974) "Notes on Action" helps to demonstrate the origin of these ideas in his own thought. Action, they all argue, is not mechanically or anatomically specified but functionally specific. Traditional theories of action reduce action to a narrowly specified range of machine-like movements, whereas the ecological approach supposes that the range of distinct movements is limited only to

distinct functional possibilities. There are as many movement patterns as there are distinct goals. Action is a rigid function of neither a top-down nor bottom-up hierarchical form of organization but a goal-directed and a flexible heterarchical form of organization. In a heterarchical form of organization intelligence operates at every level of the system. Action is thus regulated by embodied intelligence and perceptual information. There is no conflict between autonomy and regularities imposed by natural law. In fact, autonomous action emerges from the context of physical and cultural law. The action and perception system concept is based on the operations of a goal-directed or common-sense orientation to the world. Ecologically sound acting and perceiving proceeds according to well-developed habits and a mature level of psychological functioning.

Mature psychological functioning or motivational and emotional individuation are explained in Chapter 5. This chapter draws mainly from Jonathan Lear's (1990) *Love and Its Place in Nature: A Philosophical Interpretation of Freudian Psychoanalysis* and Jessica Benjamin's (1988) *The Bonds of Love: Psychoanalysis, Feminism, and the Problem of Domination*. The concept of incompletely and completely formed psychological states is derived largely from Lear's (1999) *Open Minded: Working Out the Logic of the Soul*. The main sources are supported by Charles Rycroft's (1995) *A Critical Dictionary of Psychoanalysis* and Jean Laplanche's and J.-B. Pontalis' (1973) *The Language of Psycho-analysis*. This chapter demonstrates the meaning of emotional and motivational individuation whereby an individual becomes a unique locus of desire and agency. An autonomous individual emerges from a context of intersubjective interpersonal relations and cultural context. Because reductive concepts of mind reduce autonomy and sociability to the operations of lower levels of development and to problematic modes of embodied experience, the two are thought to be mutually exclusive; however, because the psychoanalytic approach considers a full or holistic range of developmental levels and modes of experience, such mutually exclusive forms of character functioning are not implied. Alienation and conflict are not an original or

hard-wired feature of human nature. Higher levels of development and ecologically oriented modes of experience imply different concepts of sociability and autonomy. This study's reconceptualization of the individual is based on these holistic considerations.

Cartesian moral autonomy aims to avoid the consequences of separation from and loss of external goods in contrast to Humean sociability that emphasizes the social and moral benefits of external goods. External goods include not only the things that other people can give to us or take from us but the love and friendship of other people as well. Descartes' solution is to change oneself, while Hume's is to change the world. Descartes' approach largely denies the problem, while Hume does not recognize the problem as a serious issue. The psychoanalytic approach conceptualizes and evaluates separation and loss in a very different way. Our character develops by identifying with the behavior patterns or psychological functioning that we perceive in other persons, i.e., parents, teachers, friends. We unconsciously assimilate their habits of acting and being affected. Separation activates the full development of such identifications. Separation and loss are not necessarily a cause of emotional instability but instead can activate growth and development processes. In fact, separation and loss are essential for growth and development. One can be thus compensated, however, only by interpersonal relations that function at a mature or individuated level of development. The imagination not only functions to sooth anxiety but constructs enduring character structure in the process.

The aim of Chapter 5 is to develop a concept of individuated character functioning. This means that the concept of character or an individual is not just an account of defensive modes of operation that inhibit interpersonal communication but must include more open or engaged modes of operation whereby the pursuit of interpersonal relations can be an end in itself. Otto Fenichel (1945) captures the essential idea when he defines character "as the habitual mode of bringing into harmony the tasks presented by internal demands and by the external world" (p. 467). Character is

"necessarily a function of the constant, organized, and integrating part of the personality which is the ego" (p. 467). The ego is defined as "that part of the organism that handles communication between instinctual demands and the external world" (p. 467). Chapter 5 characterizes the individuation process as the development of capacities for mediation and communication between internal and external demands. This conception clarifies and develops in detail the same distinction that I introduced through Miller (1981).

At the end of Chapters 2, 3, 4, and 5 are the general implications for education and learning. Christine I. Bennett's *Comprehensive Multicultural Education: Theory and Practice* exemplifies the traditional psychological theories and reductive concepts of teaching, learning, and character functioning. Gibert Ryle (1949), in his *Concept of Mind*, provides some ecologically sound insights into learning styles (in Chapter 4). Chapter 6 is devoted to the implications for education and learning for this study as a whole. Alternative approaches are compared and evaluated in terms of principles of learning, character, and the structure of social institutions. Learning is conceptualized in explicit ecological terms, as an extension of qualitative experience rather than something above or wholly beyond it. There are also brief discussions of learning history, mathematics, and character development. The common theme is learning by example. Implications for democracy and individual conduct are included. Finally, there is a critique of the ideal of value-neutral learning and corresponding social institutions.

Chapters 2, 3, 4, and 5 all have what I call a therapeutic purpose. This means that instead of aiming to falsify or refute traditional theories in a wholesale manner, I intend to frame them in a larger interpretive context that should identify them with specific modes of experience and specific levels of functioning. The evaluation is more one of inadequacy than complete falsehood. The general purpose is to place each concept of mind in a coherent overall framework.

The general thesis for this study has three parts. *First, contrary to what reductive or subpersonal concepts of mind or individuals imply, neither interpersonal relations nor*

interpersonal perceptions are mediated by cognitive structures that invariably isolate people from one another. Second, the failure or success of interpersonal relations and perception depends on the level of developmental unity or individuation achieved by the participants involved. Third, we are not invariably disposed to be either autonomous or sociable. Instead, the two conditions can function as a complementary whole.

Now let us examine the concept of the formal structure of lived embodiment in order to develop a detailed understanding of the various modes of embodied activity and experience that are presupposed in the following chapters. When I wrote the proposal for this study, I hoped that in his *The Denial of Death* and, especially, *The Revolution in Psychiatry*, Ernest Becker would have supported certain of his more interesting and intuitively appealing psychological insights in a clear and accessible manner. For instance, I found Becker's attempts to unify cognitive and personality theory as well as his pragmatic concept of psychoanalytic psychology particularly important for this study. In the *Revolution*, Becker (1964) focuses on how one's "sense of self-value is sustained in action" and "how it is undermined when action bogs down" (p. IX). Healthy self-esteem and emotional well-being depend on the effective pursuit of unimpeded action, whereas low self-esteem and mental illness are closely connected to impeded action. Mental health and illness are conceptualized in terms of "doing," "undergoing," and "funded experience" (p. 23). The key idea is that, in contrast to the cognitively and emotionally unhealthy or "unembodied person" who "does not feel that his body is the base of the operations of the self," the "embodied" or emotionally and cognitively healthy person does feel that the self is securely grounded in the operations of the body.

Unfortunately, Becker's development of these concepts, in too many places, is incomplete and fragmentary or elliptical. In order to make the *Revolution's* keener insights more systematically clear and more accessible, I shall use the concept of the structure of lived-embodiment that is expressed so admirably well in Drew Leder's (1990) *The Absent Body*, Leder's account will not only help us to make more sense of

Becker's ideas, it will do so for every thinker and concept in this study as well. That is to say, the concept of lived-embodiment will be used to unify the entire study in a thorough and comprehensive manner. *So my arguments will not be so much about what Descartes, Hume, or anyone else really said or really meant or what they should have said or should have meant, but instead what their arguments explicitly and implicitly imply in terms of the structure of embodied activity.* This will help me to explain why reductive concepts of mind or persons are true but only in a very limited way. False inferences about differences between the mind and body are based on these very limited truths.

According to Leder (1990) Cartesian mind-body dualism achieves its plausibility by conceptualizing the body largely in terms of episodes and corresponding modes of experience that accompany impeded bodily activity and the mind exclusively in terms of unimpeded abstract intellectual activity. Descartes uses a very narrow range of experience to ground an equally narrow range of sensory and cognitive activities; the mind is reduced to higher levels of cognition, and the body to episodes of disruption of its own activity. Leder conceptualizes experiences of unimpeded, flourishing, normal, healthy, or fluent activity in terms of bodily "absence." My "lived body" always constitutes a relative absence in the world I inhabit.

> No matter where I physically move, and even in the midst of motion, my body retains the status of an absolute "here" around which all "theres" are arrayed. . . . Precisely as the center point from which the perceptual field radiates, the perceptual organ remains an absence or nullity in the midst of the perceived. (p. 13)

Leder explains that the "word *absence* comes from the Latin word *esse*, or 'being,' and *ab*, meaning 'away.' An absence is the being-away of something. The lived body, as ecstatic in nature, is that which is away from itself" (p. 22). During unimpeded activity, from the bodily here and now, attention is directed *ecstatically* outward in space and time according to one's intentions and fund of prior experience. The sensory motor surface of

the ecstatic organ or body thus stands out from itself or is projected upon the world. The word "ecstasis" includes within it

> the root *ek*, meaning "out," and *stasis*, meaning "to stand." The ecstatic is that which stands out. This admirably describes the operation of the lived body. The body always has a determinate stance--it is that whereby we are located and defined. But the very nature of the body is to project outward from its place of standing. From the "here" arises a perceptual world of near and far distances. From the "now" we inhabit a meaningful past and future realm of projects and goals. (p. 22)

Insofar as any organ of perception or action reveals a world, it conceals itself or recedes from experience. The world revealing organ therefore simultaneously participates in both ecstatic and recessive being.

While I look at my eye in a mirror, it is neither my own perspective nor the agency of sight that I observe as a distant object. " The eye that lies at the source of the gaze experientially diverges from its mirror image" (p. 17). The world-disclosing or ecstatically engaged eye exemplifies a form of absence that Leder calls "focal disappearance." Focal disappearance "refers to the self-effacement of bodily organs when they form a focal origin of a perceptual or actional field," one of the clearest examples being "the invisibility of the eye within the visual field it generates" (p. 26). Disappearance is also a characteristic of action. If I use a hammer to drive a nail, "I am not concerned with my body" but with the goal-directed action that transcends my body.

> I am concerned less with my body than with the product of my action: the hanged picture, the strike of hammer on the head of a nail. . . . My actions are motivated and organized by outer-directed concern. In order to strike the nail properly I must look at it, not my swinging hand. (p. 19)

While my swinging hand recedes into focal disappearance (though, perhaps, not as much as my eye does), the remainder of my body recedes into "background disappearance" (p. 26). My swinging hand is the focal origin of the action, whereas the rest of my body plays a supportive and subsidiary function.

Leder (1990) states a general principle: "Insofar as I perceive through an organ, it necessarily recedes from the perceptual field it discloses. I do not smell my nasal tissue, hear my ear, or taste my taste buds but perceive with and through such organs" (p. 15). The same principle applies to organs and instruments of action; the focal organ of action cannot act on itself. The foot cannot kick itself and the hand cannot strike itself, just as the fingertip cannot touch itself. I can touch my left hand with my right hand, but a sense of active agency or passive receptivity is felt in only one hand at a time. Leder also explains this in terms of the self-effacing transitivity of the body's sensorimotor surface or the "from-to" structure of perception and action (p. 15). That is to say that we act or perceive *from* the body's sensorimotor surface *to* a field of action or perception. Awareness during successful goal-directed action and perception is directed from "here" to "there" and the unimpeded execution of such activities implies that the "here" of one's activity occupies no more than the margins of awareness, while the "there" of activity occupies the center of awareness. And disappearance simply means *not to appear* in one's field of awareness.

Leder (1990) also explores the concept of bodily "thematization," or the self's objectification of its own body. For example, I can use my hand to explore the features of a dark room and perhaps find my way around, or I can explore my hand by looking at it or touching it with my other hand. When I use my hand to explore a world, it is experienced as integrated with my first person perspective (and identified with my active and invisible sense of agency or subjectivity); that is, my awareness is largely of the world that my hand discloses. Because of the self-effacing transitivity of its sensorimotor surface, the hand recedes from awareness; however, when I explore my hand with another organ of perception, it appears much more in a third-person-like perspective, as a passive object rather than an active subject of attention. Once the hand, like the eye, becomes the focus of attention, it no longer discloses a world beyond itself. As long as I use my hand to disclose the world, it is integrated with the body that I "am," but insofar

as I observe my hand as something different, and to some degree distant, from myself, it becomes the hand that I "have" (Leder, 1990, p. 77).

During unimpeded exploratory activity, my experience of the world is projected onto the world that supports my activity. My awareness is drawn inward to my body only to the extent that my powers to act or perceive are impeded. Because well formed and developed *habits* of acting and feeling make unimpeded activity possible, such habits enable me to in*habit* a world. Leder (1990) says that "Only by virtue of my habitual action patterns can I tacitly inhabit the world" (p. 89). When my activity is internally impeded, I become aware both of a divergence between my previously flourishing activity and presently impeded activity and of my body as a problematic object of perception. Insofar as the divergence is problematic, perception of my own body displaces that of the world. The body that I have asserts its presence to the mind as uncooperative with or even opposed to the outer directed goals desired by my self. Instead of operating *from* the body *to* the world, one tends to "act *toward* it" (the body) instead of the world (p. 89). Leder refers to this physiologically imposed or *involuntary* condition as bodily "dys-appearance" (p. 69). One may feel an activity disrupting sense of bodily consciousness while the body begins to lose its self-effacing transitivity or tendency toward self-concealment and a felt disunity arises between goals set by oneself and the outcome expressed with one's body.

The body can also impose its presence upon awareness during intentionality disrupting episodes of pain, fatigue, illness, emotional distress, and some modes of bodily awareness. The phenomenological characteristics of such episodes lies to the pole opposite of bodily disappearance. The "body *appears* as a thematic focus, but precisely in a *dys* state--*dys* is from the Greek prefix signifying 'bad,' 'hard,' or 'ill' and is found in English words such as dysfunctional" (p. 84). The dys-appearing "body emerges at times of pain and disease. The body may then be experienced as away, apart from the 'I'" (p. 90). The disappearing body is experienced as integrated or even one with the "I," whereas

the dys-appearing body is felt much more from the third-person-like perspective. *The dual-unity of the disappearing and dys-appearing body is the primary experiential ground from which Cartesian mind-body dualism is inferred.*

Early in a learning process, we often think more about how we are doing something than about the activity itself and its meaning. So, again, awareness is directed inward. Leder (1990) talks about learning how to swim:

> Watching others swim may teach me more than their words. Finally, even this watching must give way before the body's need for direct performance. I imitate the swimmer's gestures and at last, with misgivings, take the plunge myself. As I try to swim I consciously monitor my own movements, making sure I am kicking and breathing correctly. The problematic nature of these novel gestures tends to provoke explicit body awareness [dys-appearance].
>
> Yet the successful acquisition of this new ability coincides with a phenomenological effacement of all this. The thematization of the rules, of examples, of my own embodiment, falls away once I truly know how to swim. I no longer need to think about cupping my hands or even the right style of breathing. This now comes without conscious effort, allowing my focus to be directed elsewhere. (p. 31)

Once I become proficient, I no longer thematize the forms of the activity, but simply act from them (as a unified, fully formed, and developed organ or instrument of activity) to some swimming-related goal.

According to Leder, the emergence of bodily dys-appearance implies the reversal of a threefold structure common to action, perception, and emotional states accompanied by bodily disappearance. Leder calls this structure the "threefold telos of motility" (p. 20).

> Physically, we [1] act from a surface organ that is itself a lacuna in its actional field. In attentional terms, we [2] ordinarily focus upon the goal of activity, not our means of accomplishment. Functionally, we [3] rely upon a set of abilities we cannot fully thematize. (p. 20)

The dys-appearing body disrupts the threefold telos and reverses its corresponding experience of threefold bodily disappearance. First, awareness of a surface organ emerges

in its own field of action; and, second, self-awareness displaces goal-directed focus as, third, one's own diminishing power to act effectively becomes a problematic object of attention. Using pain as the most striking example of bodily dys-appearance and the shift of awareness from there (transcendence) to here (immanence), Leder (1990) says

> pain exerts a "centripetal" force, gathering space and time inward to the center, we are reminded of the here and now body. The very aversiveness of pain may also lead to a counteraction . . . a "centrifugal" movement in which we seek to escape this hold of pain by focusing outward upon the world, or dwelling in our past or hoped-for future. . . . The body is no longer a null point but an active presence whose call we must resist. (p. 76)

Because pain's activity-disrupting power is so clearly undeniable, and because it is undesirable in itself, it provides, perhaps, the most obvious motivation for placing a positive value on the mind's being away from the body. Everyone knows how distracting and disabling pain can be. Perhaps because higher level cognitive activities that require reading, writing, or mathematical skills can be especially vulnerable to internal and external disturbances, the Cartesian mind-body dualist (who values the intellect more than the senses) conceptualizes the body largely as a threat to mental activity.

The threefold telos of motility applies to perception, too. "Insofar as perception is itself a form of action and deeply intertwined with motility, we can . . . identify the same threefold disappearance" as exhibited in goal-directed action (p. 20). For instance, "in seeing, we physically act from the eye; we attend from it to the objects of its gaze; and this vision rests upon an unknown but unproblematic 'I can'" (p. 20). Once the eye itself becomes the object of attention, it no longer discloses a visual world beyond itself. For example, if one's eye suffers from a painful, inflamed swelling and consequent watering, visual perception is disrupted. Insofar as the eye is impaired, one cannot act from the eye but must instead act to it. The swelling is a problem that must be solved. The eye itself thereby becomes *the* object of attention.

Leder (1990) also says that "moods and emotions are world-disclosive." He quotes Paul Ricoeur, who says that "when I am moved by an emotion, I do not think of my body at all. . . . Being afraid does not mean feeling my body shake or my heart beat; it is to experience the world as something to shun, as an impalpable presence" (p. 21). An emotion, understood as a fully formed psychological state, exhibits the same kind of self-effacing transitivity or world-disclosive quality as perceptual activity and unimpeded goal-directed action. In order to maintain the world-disclosive quality or ecstatic engagement of one's emotional states, one must have formed dispositions or habits of acting and being affected properly both according to one's own unique nature and the situation in which one performs. Insofar as one acts and feels in accordance to one's own unique nature, the body recedes from awareness, but insofar as one does not adequately act or feel, the body emerges as a distraction and activity-disrupting opponent to the goals of the self. The duality-unity of the disappearing and dys-appearing body is also a characteristic of emotional states. Leder says that

> I may become aware of a raging anger twisting my body as a lethargic depression leaving me limp. I feel these emotions holding sway within me as an alien presence that I cannot shake. Anxiety provides a good example of this phenomenon. Reading a paper at an important conference I discover my hands becoming clammy, my voice beginning to crack. My heart is racing and my breathing takes on a choked quality. As I try to focus on my talk, my attention is pulled back to these physical manifestations. I watch and try to control them, breathing deeply to calm myself and modulating my voice so that my nervousness will now show. This anxiety is undoubtedly mine, but is also something from without, fighting my efforts at mastery. (p. 85)

Since an emotion such as anxiety about one's performance can be provoked by the gaze and likely evaluation of others, self-consciousness about that performance can provoke an episode of disabling dys-appearance. So in a sense the mind disturbs the body and is itself in turn disrupted by the bodily disturbance.

In the following chapters I explain how different concepts of mind and persons are derived from selected aspects of the dual-unity of lived embodiment. A brief

summation may be helpful. There are different modes of experience and activity that vary as the orientation of the whole organism changes. Every concept that I shall examine is grounded in selected modes and variations of these modes of lived embodiment. Because each concept of mind is based on selected modes of lived embodiment, some are more adequate than others rather than either true or false. Recall that variations in individuated functioning covary and complement various modes of activity and experience and that one's orientation changes accordingly.

CHAPTER 2
DESCARTES ON AUTONOMY: COGNITION, PASSION, AND ACTION

The therapeutic goal implied by Descartes' *Meditations* and *The Passions of the Soul* is to direct the individual to truths that lie beyond the epistemologically and morally defined limits of the body. The former work is concerned with a world of cognitive certainty that is made accessible by means of self-knowledge while the latter is concerned with a world of moral constancy made possible by use of self-knowledge. The projected achievement conceptualizes the individual in terms of an extreme form of intellectual and personal autonomy. Descartes marginalizes or fails to acknowledge the full significance of the mind's integration with the body and other persons. The problem for Descartes is that embodied sense-perceptions disclose a world of unacceptably ambiguous and uncertain appearances, while the passions, which are caused by external circumstances and in turn by the body, lead the mind to inconstancy with respect to morally significant patterns of acting and feeling. Although the senses and passions reveal what is harmful or beneficial to the embodied being, the body itself can also be a source of disruption and distraction that the Cartesian intellect or understanding must transcend in order to achieve cognitive certainty and moral constancy. In the most general terms, the therapeutic goal is for the mind to be away from the body. One purpose of this chapter is to show how Cartesian dualism is grounded in a narrow range of ordinary, lived experience and in what sense the mind must be away from the body in order to function well. *In this chapter I shall demonstrate that the plausibility of Descartes' inference of a mind-body dichotomy and concept of personal autonomy that is unconditioned by interpersonal relations are derived from the structure of lived embodiment but ultimately are* not

justified by it. Descartes' theory of intellectual and personal individuation must therefore be evaluated in light of more adequate concepts.

Although Descartes does not develop an explicit, specialized concept of mind, the epistemological and metaphysical arguments of his *Meditations* clearly imply a mind-body dualism or dichotomy. He attributes specific characteristics to both as well as show how the two are related to one another. *The Passions of the Soul* says much more about the mind-body relation. First, I shall examine the concept of mind expressed in the *Mediations* and then explore the account of the emotions developed in the *Passions.* My explanation of Descartes' largely reductive concept of mind or autonomous intellect has four basic components. They are, first, his general intellectual orientation, second, his concept of the body as mechanical and non-thinking, third, his concept of the mind-body dichotomy and relation, and, fourth, his concept of the mind as pure intellect or understanding. The transition from Descartes' concept of mind and intellectual autonomy to his moral psychology and personal autonomy will be provided by the concept of the free-will and its proper use. The components of Descartes' concept of emotional disorder and well-being are, first, his mechanistic physiology and its relation to the passions, second, the function and dysfunction of the passions, third, control of the passions and self-esteem, and fourth, the volitional disposition and passion called generosity. Afterwards I shall discuss the implications for education and learning.

Even though Descartes acknowledged the "indispensable role of empirical observation for reaching a decision when rival hypotheses conflict," he also believed that "the metaphysical foundations for science could be securely established by the careful introspective reflections of the isolated individual meditator" (Cottingham, 1993, p. 10). What the "whole argument of the *Meditations*" is about is

> finding a way to lead the mind away from the senses . . . in order to liberate the all-conquering intellect. What he wants to defeat through his methodological suspension of belief is the reliance of children, fools, and

> schoolmen on sense as a source of knowledge. Knowledge comes only through the liberated, mathematizing mind. (Grene, 1999, p. 559)

Descartes attempts to doubt everything in order to discover what cannot be doubted. "What Descartes wants to do . . . is to lead the mind away from the senses, to liberate reason so that we can see clearly the truths that were innate in us all along" (p. 561). Descartes (1641) says that the

> arguments which enable the existence of material things to be inferred . . . are not as solid or as transparent as the arguments which lead us to knowledge of our own minds and of God, so that the latter are the most certain and evident of all possible objects of knowledge for the human intellect. (p. 11)

So what Descartes wants is not to destroy our confidence in sensory experience but to show that it *can* be doubted and to lead us to abstract intellectual truths about ourselves and the world that (supposedly) are better known and *cannot* be doubted. The most general aim is to establish new habits of thought that will banish the ordinary world of particulars for the extraordinary world of intellectual abstractions.

Because Descartes (1641) defines the soul, mind, or self as "simply a thinking, non-extended thing" and the body as "simply an extended, non-thinking thing," the mind and body are placed in mutually exclusive categories (p. 54). Descartes also clearly recognizes the functional unity of the mind and body when he says that

> Nature . . . teaches me, by these sensations of pain, hunger, thirst and so on, that I am not merely present in my body as a sailor is present on a ship, but that I am very closely joined and, as it were, intermingled with it, so that I and the body form a unit. If this were not so, I, who am nothing but a thinking thing, would not feel pain when the body hurt, but would perceive the damage purely by the intellect, just as the sailor perceives by sight if anything on the ship is broken. (p. 56)

This passage implies a phenomenological principle Leder that (1990) calls the "chiasmic identity-in-difference of perceptual and visceral life" (p. 66). The living human organism is at once the perceiving or thinking "I" and the perceived or thought about body. In other words the invisible or unperceivable "I" and the visible or perceivable body form a dual-

unity. Affectivity or feeling is what assert the body's thematic presence to perception or awareness, thereby asserting mind-body unity, for Descartes, especially during episodes of dys-appearance. Although Descartes conceptualizes the mind and body both in terms of a kind of identity in which the body recedes from experience during a world-disclosive intellectual perception of, say, a ship, and a kind of difference implied by the body's thematic presence to awareness during an episode of, say, pain, his overwhelming emphasis is on how the body is felt as different from or even opposed to the self. And it is only through experiences of mind-body differences that he *explicitly* demonstrates mind-body unity.

Even when Descartes is not making specific theoretical claims about the mind and body, he talks about them almost exclusively in terms of their difference. Objective distance is the preferred mode of expression when talking about the body by itself.

> I perceived by my senses that I have a head, hands, feet and other limbs making up the body which I regarded as part of myself or perhaps even my whole self. I also perceived that this body was situated among other bodies which could affect it in various favorable and unfavorable ways; and I gauged the favorable effects by a sensation of pleasure, and the unfavorable ones by a sensation of pain. (Descartes, 1641, p. 52)

Keeping in mind that perception is disclosure of what is other for the perceiver, notice that he "perceived" by his "senses" that he "had" a body and that he uses perception to disclose the body to the mind, instead of using his body to disclose a world for the "I." In other words, he observes his own body as if it were a passively receptive object rather than using his body actively to observe the world. *He is accounting for only one side of the body's dual-unity*. A more adequate account would speak both in terms of the body that "I have" as one mode of experience and the body that "I am" as its complement. But because the Cartesian body and the "I" are mutually exclusive, the body can be neither the whole nor a part of the self. Consequently, the active exploratory body is largely excluded from Descartes' discourse on cognition; however, he does acknowledge the

world-disclosive qualities of some sensations of pain and pleasure. But neither of these sensations exhibits the bodily concealment that accompanies undisrupted intellectual activity of the kind that yields cognitive certainty, and neither reveals the objective structure or properties of objects or the world. The ambiguity of sensations of pain is well known; for example, an indication of heart failure may be felt as a pain in one's shoulder or the gums instead of chest pain. The same symptoms may arise from sore shoulder muscles or a tooth problem. Chest pains may arise from back problems that are unrelated to heart failure.

Descartes typically conceives of the body as not only lacking intelligence but as a non-living machine. Although the arguments of the *Meditations* do not reduce the body to a clock-like mechanism, Descartes favors the analogy. First, Descartes (1642) claims that a clock "observes all the laws of nature" whether it is well made or poorly made (p. 58).

> In the same way, I might consider the body of a man as a kind of machine equipped with and made up of bones, nerves, muscles, veins, blood and skin in such a way that, even if there were no mind in it, it would still perform all the same movements as it now does in those cases where movement is not under the control of the will or, consequently, of the mind. (p. 58)

Here Descartes conceives of the body as an automation that operates according to the laws of mechanical causation. The Cartesian automaton anticipates modern cognitive behaviorists and "physiological psychologists who would attempt to explain animal movement" in terms "characteristic of inanimate things" by "treating locomotion as a summation of causal reflex arcs" (Leder, 1990, p. 45). Cottingham (1993) suggests that Descartes demonstrates a long-term theoretical commitment to a strong body-machine reductionism. Quoting Descartes' *Treatise on Man*, he describes Cartesian physiology:

> The human body is frequently described as a machine: no "vegetative or sensitive soul" needs to be introduced, since the full range of biological processes, including "growth, digestion, respiration, the reception of sensory data, the internal movements of the appetites and the external movement of the limbs" can all be explained as "following from the mere

> arrangement of the machine's organs as naturally as the movements of a clock or other automaton follows from the arrangement of its counter-weights and wheels." (p. 112)

Cottingham also argues that only because language and thought are recalcitrant to a mechanistic explanation does Descartes need to introduce the human mind or soul. According to Leder (1990) Descartes is caught between conflicting obligations. On the one hand, his obligation to physics has led him to reduce organic movement to its supposedly mechanical causes so that how and where living organisms move is a consequence of non-living and non-thinking antecedent physical causes. On the other hand, his obligation to the life-world leads him to conceptualize the human organism as innately active and exploratory, always searching for some good that transcends itself. Desire rather than mechanical causes thereby sustains temporally conditioned world-disclosing movement.

Not until Descartes investigates the emotional life of the human organism does he *begin* to take exploratory movement seriously. Consider what he takes to be the most persuasive evidence of the self-body unity. Descartes (1641) says,

> There is nothing that my own nature teaches me more vividly than that I have a body, and that when I feel pain there is something wrong with the body, and that when I am hungry or thirsty the body needs food and drink, and so on. (p. 56)

Again, the body appears as a thematic object of perception, as the body "I have," whenever there is a divergence from its unproblematic operation. "The body comes into view at some times of disruption, presenting itself as a problem to be solved, whether on the plane of ordinary experience or philosophical reflection" (Leder, 1990, p. 132). A more adequate concept would also account for the body that "I am," that is, the body that complements the body that "I have." Perhaps, if Descartes' thoughts were more physically or more athletically oriented he might have said that "nothing teaches me more vividly that 'I am' a body than my ability to walk, run, use a tool, or explore the world." But his emphasis is on the body only insofar as it disrupts or disturbs intellectual activity.

While reflecting upon what he is, Descartes proposes to concentrate on what comes to his thoughts spontaneously; he says that "the first thought to come to mind was that I had a face, hands, arms and a whole mechanical structure which can be seen in a corpse, and which I called a body" (p. 17). According to Leder (1995) Descartes usually thinks more about the human body as an object of dissection and objective analysis than the basis of his own experience.

According to Descartes (1641) the human mind must be defined, insofar as possible, exclusively in terms of the invisibility of the first person perspective and the capacity for executing abstract intellectual operations on non-visualizable concepts. He emphasizes such activities because in them the body's absence from experience is most pronounced. The basis of autonomous *human* identity is "simply a thinking, non-extended thing" (p. 54). So consciousness itself and capacities for pure abstract intellectual thought are closely identified with one another. The mind, self, or ego is a "thing that doubts, understands, affirms, denies, is willing, is unwilling, and also imagines and has sensory perceptions" (p. 19). The "one and the same I" endures through and unifies all of its own diverse modes of thought (p. 19). But only those modes that can be dissociated from the qualities of the body and other extended things can be identified with the "puzzling 'I' which cannot be pictured in the imagination" (p. 20). Only the abstract intellectual capacities of the *seeing* "I" can transcend the epistemological limits of the *seen* body and achieve cognitive certainty.

According to Cartesian epistemology, sense-perception is obscure and confused or not clear and distinct since it arises from the union of the mind and body. *Ambiguity* is a word I prefer because Descartes often compares two perceptions when one is true and the other false, or one is more clear and distinct than the other. Descartes' (1641) "general rule" is that whatever I intellectually perceive or conceive "very clearly and distinctly is true" (p. 24). Quoting Descartes' *Principles*, Cottingham (1993) explains that a perception is clear "when it is present and accessible to the attentive mind, just as we

say we see something clearly when it is present to the eye's gaze and stimulates it with a sufficient degree of strength and accessibility" (p. 33). The inner light of intellectual perception is conceived as analogous to the external light of sensory-perception. With very clear and distinct or cognitively certain intellectual-perceptions or conceptions, the inner-outer analogy breaks down with respect to distinctness. Distinctness implies that "as well as being clear, the perception is so sharply separated from all other perceptions that it contains within itself only what is clear" (p. 33). That is to say that a very distinct perception is completely unambiguous or cognitively certain. Because clear and distinct perceptions are independent of the conditions of embodiment and context, there can be no divergences among the truth values of such perceptions at different times and places. Divergences present the dys-appearing body to consciousness as a thematic object of attention and thereby provokes the self to reflect on the embodied conditions of its own perceptual activity. Descartes is particularly concerned with body as a source of deception that can cripple the search for truth about the world and the self.

Consider how the body of the dreamer might deceive the mind. First, Descartes (1641) says that "how often, asleep at night, am I convinced . . . that I am here in my dressing gown, sitting by the fire--when in fact I am lying undressed in bed" (p. 13). But later he argues that a qualitative distinction between waking and sleeping states is possible. "I now notice that there is a vast difference between the two, in that dreams are never linked by memory with all the other experiences of life as waking experiences are" (p. 61). The important distinction here (though not in Descartes' terms) is between spontaneous irrational mental activity and rational, conceptual thought organized into a coherent web of belief or propositional attitudes. The Cartesian conceptual mind neither recognizes irrational activity as its own nor suspects that non-propositional thoughts can be incorporated into the web of rationally organized belief. Until that time, Lear (1999) says that the "mind may regularly have to suffer its own activity" (p. 93). In other words, it may undergo or suffer episodes of bodily dys-appearance.

Another example of divergence is a disparity between the perception of an object from a distance and the same object nearby.

> Sometimes towers which had looked round from a distance appeared square from close up; and enormous statues standing on their pediments did not seem large when observed from the ground. I found that the judgements of the senses were mistaken. (Descartes, 1641, p. 53)

Descartes ignores the implicit exploratory activity and the possibility of one temporally continuous perception and instead thinks in terms of two distinct perceptions (one better than the other) for at least two reasons. First, goal-directed activity, values, or any kind of teleological principles must be kept separate from the objective truths of mathematical and physical concepts. Second, only pure intellectual activity can afford one the level of cognitive certainty or complete absence of ambiguity desired by Descartes. A contrast between sense-perception and intellectual-perception should be helpful.

> For example, there are two different ideas of the sun which I find within me. One of them, which is acquired as it were from the senses and which is a prime example of an idea which I reckon to come from an external source, makes the sun appear very small. The other idea is based on astronomical reasoning, that is, it is derived from certain notions which are innate in me (or else it is constructed by me in some other way), and this idea shows the sun to be several times larger than the earth. Obviously both ideas cannot resemble the sun which exists outside me; and reason persuades me that the idea which seems to have emanated most directly from the sun itself has in fact no resemblance to it at all. (Descartes, 1641, p. 27)

The general epistemological problem implied by this passage is that psychological or subjective states made possible with or through organs of sensation may partly--if not wholly--fail to disclose what is other. The existence of an external world that corresponds to one's embodied experience may thereby be called into doubt and the therapeutic purpose becomes one of transcending the epistemological confines of the senses and body. Of course, the states of sense organs or other subjective or physiological states that are used to disclose what for the self is other must in some way be distinct from those states that do not or cannot; but the problem here is with the possibility that attention is

being directed to peculiar features of one's own perspective or organs of sense or to objects ambiguously revealed by embodied sensory-perceptions instead of being directed to what is unambiguously other. The traditional philosophical conclusion drawn from this skew of attention is wholesale skepticism about the epistemological characteristics of the senses. For some perceptual theorists the problem is that veridical perception of the ordinary, common sense, or taken-for-granted world must be derived from formless or ambiguous sensation. Intellectual construction processes are called on to continuously convert inadequately formed sensations into truthful perceptions. By contrast, Descartes' primary concern is with the intellectual-perception or conceptual grasp of abstract mathematical and geometrical laws, principles, and rule-governed demonstration procedures that describe the extended, quantifiable properties of things.

For Descartes ideas belong in two mutually exclusive categories. Within ourselves we can find ideas that originate from embodied sensory-perceptions and the visual imagery of the imagination or from the immaterial mind that understands general concepts that are based on the essential nature of extended things. Descartes (1641) uses the unlimited malleability of a piece of wax to demonstrate how the massive ambiguity of the objects of sensory-perception and imagination cannot be the basis of true judgment. First, he notices how a solid piece of wax has a particular taste, smell, color, shape, size, and sound when it is tapped. Then he melts it and observes how all of its sensory qualities change and suggests that the combination of sensory qualities can undergo an infinite number of changes. Yet no one doubts that the *same* wax remains through all the changes. Both the basis of object identity and the faculty that grasps that identity must be shown. Descartes (1641) asks, "What was it in the wax that I understood with such distinctness? Evidently none of the features arrived at by the senses; for whatever came under taste, small, sight, touch or hearing has now altered--yet the wax remains" (p. 20). Next, he asserts that "I would not be making the right judgment about the nature of the wax unless I believed it capable of being extended in many more different ways than I

can ever encompass in my imagination" (p. 21). Because the Cartesian imagination thinks exclusively by means of concrete visual images, it *cannot* represent a countless number of possible changes. "I would not be making the right judgment about the nature of the wax unless I believed it capable of being extended in many more different ways than I can ever encompass in my imagination" (p. 21). *What Descartes wants is a mode of thought that affords the finite thinker an unambiguous grasp of an infinite number of possible modes of extension.* So the "nature of this piece of wax . . . is perceived by the mind alone" (p. 21). For this we need the understanding or intellectual capacity for abstract symbol use and the language of mathematics and geometry. Object identity is based on extension and its infinite modes and only the mind grasps extension. Extension is the "defining characteristic of matter or 'corporeal substance,' and in principle all the various properties of mater can be exhibited as 'modes' of extension, i.e., various ways something can be extended" (Cottingham, 1993, p. 60). For Descartes, embodied experience, at best, discloses an obscure and confused or ambiguous world, whereas the true nature of things is unambiguous or clear and distinct.

The invisible Cartesian I that grasps mathematical truth and infinity is better and more easily known than anything else. Self-knowledge depends in no way on the disclosure of what is other but only on the direct grasp of what is in oneself that clearly and distinctly discloses what is other. Cartesian self-knowledge is of the absolute "here" around which all "theres" must be arrayed, the element of the from-to structure that absolutely resists thematization. Anything that demonstrates, however slightly, any qualities of visibility, perceivability, or conceivability must be ranked among the "theres" that surround the "I" or absolute "here" of consciousness. The Cartesian I is defined by the mind's effort to recede from the sensorimotor surface of the body in order to limit its ecstatic engagement to objects of pure understanding or highly abstract and general conceptual thought. The epistemological purpose is for the mind to be away from deceptive and disruptive experiences the dys-appearing body. Insofar as objects are

abstract and general they are close to the nature of the I, whereas insofar as objects are concrete and particular they are distant from the I. Because the objects of abstract conceptual thought or intellectual-perception exhibit but the thinnest--if any--observable qualities, they are among the I's closest relatives in terms of invisibility. For Descartes, mathematical abilities are identified with the essential nature of the self.

The supposed basis for the immateriality of the self and its objects can be demonstrated in a number of ways. But according to Leder's (1990) phenomenology, the immateriality of the mind is an *illusion* created by the experienced structure of lived embodiment. Contrary to Descartes, Leder argues that there is a principal, material organ of intellect. The brain, according to Leder, is central because it is connected to everything in the nervous system and the nervous system is connected to everything else. So even though we may concede that no organ has been conclusively identified as *the* organ of intellect, there must be one if the mind has an organic basis. Whatever the identity of that organ or group of organs, "its central role in the 'from' structure of perception and motility dictates the focal disappearance surpassing that of the other surface organs" (p. 114). "That from which I perceive and act necessarily resists my thematization. As I gaze upon the world, I cannot see my own eyes. The disappearance of the brain is an expression of this same principle" (p. 113). "This invisibility of the brain is one experiential source of the human mind as immaterial. Our principal organ of mentality seems nowhere to register in the physical world" (p. 115). Leder observes that we apprehend no material basis for our intelligence and coordination.

> My brain, as that which I exist from within, manifests no physical presence for me to know. I cannot get a distance on it, render it visible, for it is hidden at the very heart of me wherever I go. Human mentality can thus seem immaterial, disembodied, as if of another order of things. An experiential disappearance is read in ontological terms. Yet . . . this disappearance arises precisely from the *embodied* nature of mind. The body's own structure leads to its self-concealment. (p. 115)

Whether the I is organically based or immaterial, it resists any attempt to introduce objective distance from itself. There is "no second organ of consciousness with which to observe the first" (p. 113).

Abstract mathematical language, the instrument, or perhaps organ, of mathematical concepts and thought also undergoes focal disappearance. Leder (1990) argues that spoken and written language "both involve an effacement of the body of the sign and the body of the subject engaged with the language" (p. 123). Language, like any organ or instrument of activity conceals its embodied roots. Speaking in more general terms that apply to language acquisition, Leder explains the experiential disappearance that accompanies the incorporation of skills. "The unproblematic use of a skill [i.e., mathematics] coincides with its participation in the body's focal disappearance. Whereas in the state of learning I act *to* the skill qua thematized goal, in mastery it becomes the *from* which I operate upon the world" (p. 32). Having learned how to do mathematics and geometry, they are now the taken-for-granted means whereby I proceed to understand the properties of the abstract objects of mathematics and geometry. While learning a new language, copious thematization is required. One must study and memorize abstract symbols, rules, proof, theorems, constants, rule-governed procedures, and so on. Skill acquisition is accomplished through a process termed *"incorporation"* (Leder, 1990, p. 31). Leder (1990) explains that

> from the Latin *corpus*, or "body," the etymology of this word literally means to "bring within a body." A skill is finally and fully learned when something that was once extrinsic, grasped only through explicit rules as examples, now comes to pervade my own corporeality. My arms know how to swim, my mouth can at last speak the language. This embodied aspect is already suggested by the etymological root of the word *language* in the word *tongue*--when I finally master a foreign language, it is as if all the instruction, study, and practice finally have sunk right into my tongue. A skill has been incorporated into my bodily "I can." (p. 31)

Leder is talking about what I call fluent or unimpeded activity during which the bodily "I can" or organ of activity recedes from experience. Because consciousness or the "I"

conceals its own roots in the bodily "I am" and the anonymous bodily "it can" by means of its ecstatic engagement with what lies beyond the body, the "I think" *appears* to operate with no organic basis. While the focal disappearance of the embodied "I" surpasses that of any other organ of activity, the focal disappearance of incorporated mathematical and geometrical concepts expressed in language is, perhaps, surpassed only by that of the "I." Mathematical abilities thereby acquire a comparable *appearance* of immateriality.

Now let us shift the emphasis to objects of mathematical cognition in order to show how the Cartesian self transcends the epistemological isolation implied by its direct grasp of only internal representations. Descartes' purely cognitive therapy, by means of newly discovered and developed cognitive capacities, enables the thinker to transcend the epistemologically defined limits of the body in order to disclose what is unambiguously other or true. First, because abstract mathematical and geometrical concepts can be used to demonstrate the extended and quantifiable properties of actual concrete objects, they are empirically verified. Second, because such supposedly immaterial or other-worldly concepts can be extended not only to objects that lie beyond one's individual experience but to objects that lie beyond all possible experience (i.e., objects of infinite number or complexity), they *appear* to be of a different order of existence than that of physical bodies and embodied experience. Consider what is probably Descartes (1641) clearest distinction between pure understanding and imagination, that is, between the thinker's distinct capacities for recognizing true or unambiguous, abstract objects and ambiguous, concrete objects. First, imagination is "nothing else but an application of the cognitive faculty to a body which is intimately present to it. . . . When I imagine a triangle, for example, . . . I . . . see three lines with my mind's eye as if it were present before me" (p. 50). So the Cartesian imagination constructs concrete and particular visual images of objects that are clear and distinct only insofar as they are neither numerous nor complex.

> But if I think of a chiliagon, although I understand that it is a figure consisting of a thousand sides just as well as I understand the triangle to be a three-sided figure, I do not in the same way imagine the thousand sides or see them as if they were present before me. (p. 50)

The figure, he argues, will be confused and obscure, but, again, I prefer the term ambiguous. If actual figures of the same diameter were presented to me, one with, say, 1,000 sides, another with 1,001 sides, and yet a third with 1,003 sides, I doubt that I could distinguish one from the others without first counting the sides. In fact, I doubt anyone could reliably make perceptually based distinctions among such figures without counting first. But by counting, we would be using the understanding or intellect. So for Descartes sensory-perception and the power of imagining exhibit modes of thought and experience that are qualitatively and categorically distinct from those of the power of understanding. Descartes (1641) explains that

> when mind understands, it in some way turns toward itself and inspects the ideas which are within it; but when it imagines, it turns toward the body and looks at something in the body which conforms to an idea understood by the mind or perceived by the senses. (p. 51)

The identity of the thinker is largely reduced to the capacity for recognizing and demonstrating mathematical certainties. The certainty of Cartesian self-knowledge serves as a model for what is true or unambiguous. The pursuit of knowledge for Descartes is the pursuit of what is most like the Cartesian self.

While reflecting upon an infinitude of possibilities implied by diverse modes of extension, conceived in terms of object shape, size, position, motion, number, continuous quantity, and so on, Descartes (1641) asserts that

> the truth of these matters is so open and so much in harmony with my nature, that on first discovering them it seems that I am not so much learning something new as remembering what I knew before; or it seems like noticing for the first time things which were present within me although I had never turned my mental gaze upon them before. (p. 44)

Descartes believes that innate ideas are the best and most accessible source of knowledge about the essential nature of cognitive and moral truth. Hence, the self is a better source of knowledge than embodied experience.

Now let us briefly examine how the independent existence of objects conceived by the Cartesian intellect is established. This helps to demonstrate the bounds of the autonomous intellect as well as its connection to objective reality. First, because the *finite* understanding is able to grasp an unambiguous concept of *infinity*, it discloses for itself what is clear, distinct, and non-visualizable *like itself* but wholly *beyond itself*. Next, although I can imagine a triangle, perhaps like none that exists or ever has existed anywhere outside my thought, "there is still a determinate nature, or essence, or form of the triangle which is immutable and eternal, and not invented by me or dependent on my mind" (p. 45). As long as it is a triangle, its properties conform to the independently existing laws of geometry. And "since these properties are ones which I now clearly recognize whether I want to or not . . . it follows that they cannot have been invented by me" (p 45). Because all the necessary principles are native to my own mind, I know an infinite number of figures that I have never encountered through experience. "For I can think up countless other shapes which there can be no suspicion of my ever having encountered through the senses, and yet I can demonstrate various properties of these shapes, just as I can with the triangle" (p. 45).

If we recognize the truth of a clear and distinct perception whether we want to or not, it may seem that we should never make mistakes. But we do. Descartes (1641) asks,

> So what then is the source of my mistakes? It must simply be this: the scope of the will is wider than that of the intellect; but instead of restricting it within the same limits, I extend it to matters which I do not understand. Since the will is indifferent in such cases, it easily turns aside from what is true and good, and this is the source of my error and sin. (p. 41)

The understanding or intellect grasps things clearly and distinctly only on its own purely mathematical terms, whereas the action of the will encompasses objects of action, sensory-perception, and imagination that, by definition, are not reduced or not reducible to propositions that describe extended properties. Freedom of choice is therefore not bounded by cognitive certainty. Descartes explains that if

> I simply refrain from making a judgement in cases where I do not perceive the truth with sufficient clarity and distinctness, then it is clear that I am behaving correctly and avoiding error. But if in such cases I either affirm or deny, then I am not using my free will correctly. (p. 41)

Also, it is "clear by natural light that the perception of the intellect should always precede the determination of the will" (p. 41). The will operates according to variable grades of freedom. The lowest grade "simply consists in our ability to do or not to do something (that is, to affirm or deny, or pursue or avoid)" (p. 40). But

> In order to be free, there is no need to be inclined both ways; on the contrary, the more I incline in one direction--either because I clearly understand that reasons of truth and goodness point that way, or because of a divinely produced disposition of my inmost thoughts--the freer is my choice. Neither divine grace nor natural knowledge ever diminishes freedom; on the contrary they increase and strengthen it. (p. 40)

The lower grade of freedom is identified with the ambiguity or diverse possibility of the world of goal-directed action, whereas the higher grade of freedom is identified with the world of the intellect in which the perception of an idea or concept that is so clear (intense) and distinct (unambiguous) that it compels the will's spontaneous affirmation. The higher grade of freedom "consists simply in the fact that when the intellect puts something forward for affirmation or denial or for pursuit or avoidance our inclinations are such that we do not feel we are determined by external force" (p. 40). That is to say that a "great light in the intellect" and the language of abstract concepts frees the mind from the ambiguity of embodied sensory-perception and the anxiety of irresolution (p. 41). Descartes (1649) says that "keeping the soul balanced, as it were, between several actions open to it, irresolution causes it not to perform any of them, and thus gives it time

to make a choice before committing itself" (p. 390). Since "irresolution is also a kind of anxiety" and anxiety can provoke dys-appearance of the body's sensorimotor surface and visceral depths, cognitive certainty affords one a sort of emotional calmness, tranquility, or freedom from anxiety and activity disrupting "movements of the spirits" (p. 390).

In the mechanistic Cartesian physiology, "spirits" are "merely bodies" that "have no property other than that of being extremely small" and that of moving "very quickly" (p. 332). Spirits are "purely physical items" that "play the role which is today filled by neuro-electrical impulses; they are the medium for the transmission of information throughout the nervous system." These atomistic particles are "pneumatically" propelled components of the "mechanical micro-events" that operate the circuits of the body's neurological and motor systems (Cottingham, 1993, p. 13). This includes operation of the musculature and the internal organs or visceral functions that support the ecstatic engagement or world-disclosive activity of the body's sensorimotor surface. For example, breathing, digestion, blood circulation, or neurological functioning all operate with effective reliability in a healthy person without awareness or consent. Fear, however, can provoke a problematic, activity disrupting divergence from normal visceral operation, a divergence that is accompanied by a thematic or problematic perception of those functions. For instance, when encountering an object of fear, one's ability to act effectively can be impaired or disabled by nervousness, trembling, a churning stomach, a rapid heart beat, or irregular breathing. As awareness is drawn inward to the presence of disrupted visceral activity and the intertwined disruptions of sensorimotor activity, one's power to deal with the object of fear diminishes. The internal objects of experience that emerge during the thematization or dys-appearance of visceral motility are, for Descartes, *reducible* to "movements of the spirits." Again, *the Cartesian body is explicitly identified with those modes of appearance in which its presence emerges in experience as an opponent to which the self is vulnerable.* Leder (1990) refers to the visceral mode of bodily dys-appearance as "depth" dys-appearance (p. 69). "Depth" stands in contrast to

"surface" dys-appearance and depth *dys*-appearance is the phenomenological complement to depth *dis*appearance. Unimpeded or flourishing action requires both modes of disappearance to be operative.

Insofar as one *undergoes* or *suffers a* passion, say, of fear or anxiety, one also undergoes an episode of intertwined bodily depth and sensorimotor surface dys-appearance. Passions or emotions that should be about something, say, a fear or anxiety-provoking object, lose their intentional or world-disclosive quality to the extent that attention is drawn back to one's own surface and depth. The "I" or self thereby appears to recede from the sensorimotor surface of the *acting* body that one "is" into the depths of the body that one "has" but cannot operate or operate very well. So, the problem with the passions is one of their sometimes distracting--if not overwhelming--excess. In contrast to the actions of the soul that, by definition, make things happen, the passions, by definition, happen to the soul. As long as the passions and the soul agree on how one should act and be affected, there is no problem. But the Cartesian body is a kind of automaton that can operate according to its own innate and learned dispositions to act and feel that can proceed independent of and even opposed to judgement based on true knowledge about good and evil. The coercive power of the passions to affect the soul is comparable to that of external objects of sensory-perception. The passions, Descartes (1649) says, are "caused . . . maintained and strengthened by some particular movement of the spirits" (p. 345). A physiological movement that causes, say, fear or anger about something, may be felt as a "disturbance" in the "heart." And "until this disturbance ceases they remain present to our mind in the same way as the objects are present to it while they are acting upon the sense organs" (p. 345). Such felt disturbances, in Leder's terms, coincide with the emergence of visceral presence in experience. Descartes says, "It is the body alone that we should attribute everything that can be observed in us to oppose our reason" (p. 346). To be more specific, the "dys-appearing body" opposes and is *opaque* to our reason. Because excessive passions can be so disempowering, Descartes'

solution, again, is for the mind to be away from the body. Leder (1990) explains that "the soul can only detach itself from a certain sort of body, one calm, healthy, and awake" (p. 132).

Descartes (1649) says that the "natural function of the passions" insofar as they "relate to the body" is to "move the soul to consent and contribute to actions which may serve to preserve the body or render it in some way more perfect" (p. 376). When a strong passion causes the expression of a strong disposition to act contrary to one's best judgment, "the most the will can do while this disturbance is at full strength is not to yield to its effects and to inhibit many of the movements to which it disposes the body" (p. 345). For instance, when we are extremely angry with someone and disposed to respond with violent rage, we act according to our own good judgment by *fighting* the urge to strike that person or otherwise respond irrationally. But the weakest souls simply allow themselves to be "carried away by the present passion" (p. 347). In other words, since they generally act in order to satisfy immediate needs or impulses with little or no regard for long-term consequences or goals, the weakest souls have not acquired what psychoanalytic psychology calls the reality principle. Descartes thinks in terms of opposed causal powers or contrary impulses, the soul on one side and the animal spirits on the other and "the stronger cancelling the effect of the weaker" (p. 346). The strong soul can easily "battle" and "conquer" the passions (p. 347).

Descartes conceptualizes the deceptive quality of the passions in terms of hyperbolic emotional representations that magnify and polarize the ambiguities of object and interpersonal sensory-perception. People may be led to act against their best judgement since

> the passions almost always cause the goods they represent, as well as the evils, to appear much greater and much more important than they are, thus moving us to pursue the former and flee from the latter with more ardour and zeal than is appropriate. (Descartes, 1649, p. 345)

The passions unchecked by the intellect thus lead us to violate the reality principle in some cases by representing things as *either* wholly good *or* wholly bad. Such mutually exclusive categories of thought can determine equally extreme, uncritically, and unreflectively pursued courses of action. The most serious character flaw is with what Descartes (1649) calls "abjectness, or humility as a vice." This condition

> consists chiefly in a feeling of weakness or irresolution, together with an incapacity to refrain from actions which we know we will regret later on, as if we lacked full use of our free will. It also involves the belief that we cannot subsist by ourselves or get along without many things whose acquisition depends on others. (p. 386)

This passage indicates two problems for which Descartes prescribes solutions. First, the weak and irresolute soul has not acquired the disposition or habit of making firm and determinate judgments that dispose the body to act accordingly. Notice also that irresolution here is a *felt* condition in which the soul undergoes the actions of bodily dispositions. Second, the locus of control or agency is determined by a false *belief* about self-sufficiency and the kind of goods that improve and sustain our happiness and well-being. Action is directed largely, if not entirely, by external goods whose acquisition and secure possession may lie beyond the full control of the individual actor. Both emotional stability and constancy with respect to morally significant actions are therefore vulnerable to the unstable and inconstant influences of fortune as well as the wishes and actions of other people. Also there is a perceived divergence between one's *knowledge* or explicit awareness of what one should do and the course of action pursued by the body. Bodily presence emerges in experience as a fierce and cognitively opaque opponent to one's own rationally defined long-term goals.

Self-esteem should not be based on and thus vulnerable to the vicissitudes of external goods. Such goods should be held in low esteem. Among the external goods identified by Descartes (1649) are "wealth," "honor," "intelligence," "knowledge," and "beauty" (p. 384). Such goods render many of us unequal in terms of self-esteem since

we do not all possess them equally. When self-opinion is regulated by the gains and losses of external goods, pride and humility may conform to the same pattern of opposed emotional extremes that the passions do generally. Vice implies the disposition or habit to pursue things that depend on others and fortune, while vanity implies that self-esteem and self-contempt are governed by the possession or lack of such goods. According to Descartes,

> vice usually proceeds from ignorance, and those with the least knowledge of themselves are the most liable to become prouder and humbler than they ought. For they are surprised by anything new that comes their way, and so they attribute it to themselves, and have esteem and contempt for themselves depending on whether they judge the novelty to be to their advantage or not. (p. 387)

Cartesian self-knowledge relies on a number of components. First, we must know what lies wholly within our power to control. This is our thought alone. Freedom of choice or free-will and its proper use are the key to our happiness and well-being. Although Descartes does not make it fully explicit, the proper use of the will is constrained by its consequences in action. Self-knowledge therefore includes knowledge of one's ability to control external things. Such abilities specify certain kinds of situations that I can or cannot handle or handle well. My happiness and well-being depend upon being able to attain and securely possess things that benefit my body and improve my mind. Second, I must not only know how to act but also how to be properly affected by my own performance as well as my situation. Emotional powers can be known only with respect to specific fields of action. I must not only know what I can do and how I will be affected but must be able to distinguish good from evil. Such moral judgments derive their content and authority from the same source as mathematical truths. *Self-knowledge as a direct grasp of the understanding and its contents is the first principle of action and emotion as well as mathematical truth.* Once again, our capacity for detached abstract symbol use is primary.

When Descartes describes the passions in terms of their alternation between polarized emotional states or extreme highs and lows that are not controlled by or integrated with the actions of the self, he is conceptualizing a form of irrationality. Irrationality here also means that although affective states *immediately* and *infallibly* disclose themselves to the self or the "I," they are not attuned to and therefore do not truthfully disclose a world beyond themselves. Instead, the structure of one's thought is revealed. Such thoughts are neither understood nor controlled by the self. Descartes is also wrestling with the problem of individuation or psychological integration. His vain and vicious characters are disposed to make the passion-driven cognitive error of projecting their own hyperbolic affective states upon unexpected external events to which they are disposed to respond with too much or too little passion. They judge that their extreme, passionate responses reveal what is truly other. A sufficient "surprise" tends to immobilize exploratory activity, thereby impairing the search for a more disclosive perception. Anyone in such a state is, to some extent, *imprisoned within distorted or false representations*. Sufficient "surprise" leads to "astonishment" or the complete immobilization of exploratory or drive activity (Descartes, 1649, p. 354). Continuity of emotional-intent or desire is thereby disrupted as the I recedes from ecstatic sensorimotor involvement.

Hans Jonas (1966) explains that insofar as a living and moving organism is living and moving it is open to the world. Openness means that through the power of perception an organism transcends itself externally or spatially and through the power of emotion it transcends itself internally or temporally as it discloses "the next impending phase of its own being toward which it moves" (p. 100). An episode of Cartesian astonishment implies that the I is confined to the "here" and "now" of organic immanence instead of disclosing a world of action, emotion, and perception. Goal-directed action requires continuous emotional intent in order to bridge the *temporal distance* between the present self and its future goal or object. Because the sufficiently weak soul is guided only by the

passion of the present moment, his or her capacity for mature desire and goal-directed action is limited by the ongoing threat of short-term disruptions. Long-term commitments are therefore difficult to achieve and maintain.

For Descartes, the primary passion of temporal transcendence or disclosure of what comes next for myself and my world is desire. Descartes (1649) says that desire "always concerns the future" (p. 350). Desire is both a passion and a volitional disposition; it both happens to the soul and is caused by the soul. Desire is also an innate exploratory drive since it leads to the "search for the good" (p. 369). As a passion desire "agitates the heart more violently than any other passion, and supplies more spirits to the brain" (p. 363). The

> passion of desire has this special characteristic: the volition to acquire some good or avoid some evil sends the spirits rapidly from the brain to all the parts of the body . . . both in order to maintain and strengthen the idea of the volition and to pass from there into all the sense organs and all muscles that can be used for obtaining what is desired. (p. 365)

Desire is both emotion and intent. It may be good or bad, too. Descartes explains: "As for desire, it is obvious that when it proceeds from true knowledge it cannot be bad, provided it is not excessive and that it is governed by this knowledge" (p. 378). Likewise, desire

> cannot fail to be bad when based on some error. And it seems to me the error we commit most commonly in respect of desires is failure to distinguish adequately between the things which depend wholly on us from those that do not depend on us at all. (p. 379)

We must learn to desire only those things that lie wholly within our power to attain and securely possess. Otherwise frustration can destroy our well-being and happiness. Because the "passions cannot lead us to perform any action except by means of the desire they produce, it is desire we should take particular care to control; and here lies the chief utility of morality" (p. 379). "Regarding things which do not depend on us in any way, we must never desire them with a passion" (p. 379). When we learn to desire and choose

only those things that are good for us and depend on us or are in our power, we are using our free will or freedom of choice properly. Descartes explains that "most of our desires extend to matters which do not depend wholly on us or wholly on others, and we must therefore take care to pick out just what depends on us, so as to limit our desire to that alone" (p. 380). Although I would like to argue that by way of experience we should develop and form habits of acting and feeling proper to oneself and the situations in which one operates, Cartesian therapy derives almost all of its authority from the power of intellectual habits.

Part of the Cartesian remedy or therapy for disorders of the passions is the pursuit of virtue. Virtues are "habits of the soul which dispose it to have certain thoughts" (Descartes, 1649, p. 387). Descartes says that we should "always try to master 'ourselves' rather than fortune" and "aim to change our desires rather than the order of the world" (Cottingham, 1993, p. 130). The "pursuit of virtue consists in doing good things that depend on us" (Descartes, 1649, p. 379). We should learn to desire only what we *can* pursue. Cartesian morality seems to presume both that all we can control are our thoughts (i.e., desire) and that our individual, embodied power to attain and maintain secure possession of external goods is sufficiently fixed to be morally neutral. Descartes (1649) explains that we should "become accustomed to believing nothing lies in our power except our thoughts, so that after doing our best in dealing with things external to us, whatever we fail to achieve is absolutely impossible as far as we are concerned" (p. 130). We should accept our limits, and as long as we act according to our best judgment, there is no need for regret or self-recrimination. Desire should be regulated by the limits of our power to successfully pursue or avoid. Consequently, "what we desire in this way cannot fail to have a happy outcome for us, since it depends on us alone, and so we receive from it all the satisfaction we expected from it" (p. 379). Virtue is defined by the limits of our power to do or not to do, whereas vice falls outside such limits.

Desire can be regulated by means of habit formation. Therapy consists in breaking old associations that dispose the body to act and feel against our best judgment and form new associations that dispose us to act and feel in conformity with those judgments. The ecstatically engaged self or "I" is thereby functionally unified with the experientially absent body. Descartes (1649) describes the principle of association and how it can be used:

> Although the movements . . . of the spirits . . . which represent certain objects to the soul are naturally joined to movements which produce certain passions in it, yet through habit the former can be separated from the latter and joined to others that are very different. Indeed a habit can be acquired in a single action and does not require long practice. (p. 348)

For instance, we might enjoy a particular kind of food until one day we eat it and immediately afterwards become very ill. Then we may permanently associate that food with illness and find its flavor or even the thought of eating it quite repulsive. The "idea" of such associations are "imprinted"in the brain (p. 376). Descartes further clarifies the principle of association: "Our soul and body are so linked that once we have joined some bodily action with a certain thought, the one does not occur thereafter without the other occurring too" (p. 375). This causal sequence reflects Descartes' commitment to physics and physical concepts. Descartes' method for forming new associations and breaking old ones is largely reflective. We persuade ourselves in a kind of reflective or meditative thought process in which we attempt to organize our ideas or associations according to our best judgment. *Should cognitive therapy form new and more satisfactory associations, action and passion (supposedly) will conform automatically.* We can "correct our natural faults by striving to separate within ourselves the movements of the blood and spirits from the thoughts to which they are usually joined" (p. 403). Perhaps if one, say, wants to quit smoking cigarettes, one might first habitually reflect upon all the disadvantages that accompany smoking. We accustom ourselves to think of the problems that smoking causes and the advantages of quitting instead of the normally associated

pleasures. Doing so in advance of quitting should be helpful, but once one does quit, overwhelming urges to smoke should be countered by thinking through one's well rehearsed reflections. "Even the weakest souls could acquire absolute mastery over their passions if we employed sufficient ingenuity in training and guiding them" (p. 348). But even Descartes concedes that very few are adequately prepared to fully master the passions in a wide variety of situations.

Because bodily dispositions resist the direct actions of the will so effectively, habit formation provides an indirect approach to altering bodily dispositions. Habit also helps to overcome excessive irresolution. Since irresolution keeps the soul balanced between two actions by causing us not to perform any of them, it affords us time for deliberation. "But when it lasts longer than it ought, making us spend time in deliberation the time required for action, it is extremely bad" (p. 390). Irresolution is a passion, in contrast to an act of will, insofar as it impairs judgment because "our anxiety of choosing wrongly increases our uncertainty" (p. 390). A weak and confused intellect whose activity is disrupted by the movements of the spirits can, in thought, multiply ambiguities or possibilities beyond what actual objects or events indicate. Further, since action frequently must precede complete understanding, the proper moral use of the will is not bounded by cognitive certainty. But the proper use of the will in action is bounded by the thinker's ability to pursue and avoid; and, to the extent that uncertainty prevails, proper choice is appropriately constrained and thus empowered by properly formed habits of thought or associations. In fact, the yearning for cognitive certainty can paralyze action altogether. The

> remedy against such excess is to become accustomed to form certain and determinate judgments regarding everything that comes before us, and to believe that we always do our duty when we do what we judge best, even though our judgment may perhaps be a very bad one. (p. 391)

"Firm and determinate judgments" based on knowledge of good and evil are the "proper weapons" with which the strong soul "conquers" the passions (p. 347).

The more inclusive remedy or therapy for disorders of the passions requires the acquisition of the volitional disposition Descartes calls generosity. Generosity is "directly opposed" to "abjectness, or humility as a vice" (Descartes, 1649, p. 386). The character who has acquired generosity "will never passionately desire things which are outside our power to achieve, and whose non-attainment may frustrate us and destroy our well-being" (Cottingham, 1993, p. 67). Generosity implies the enduring or constant practice of virtue. Those who possess generosity do not value external goods very highly. Neither do they envy nor feel particularly inferior to those who are wealthy in external goods. "For all these things seem to them very unimportant by contrast with the virtuous will for which they alone esteem themselves, and which they suppose to be present, or at least capable of being present, in every other person" (Descartes, 1649, p. 384). The greatest good, possessed by all, is the virtuous or potentially virtuous will. Because a good or virtuous will is native to all souls, obscure and ambiguous sensory-perceptions or ignorance must be the epistemological cause of moral error.

According to Descartes (1649), "true generosity . . . causes a person's self-esteem to be as great as it may legitimately be" (p. 384). True generosity has two components, one epistemological or cognitive and the other is affective.

> The first consists in his knowing that nothing truly belongs to him but this freedom to dispose his volitions, and that he ought to be praised or blamed for no other reason than using this freedom well or badly. The second consists in his feeling within himself a firm and constant resolution to use it well--that is, never to lack the will to undertake and carry out whatever he judges to be best. To do this is to pursue virtue in a perfect manner. (p. 384)

Here we find an extreme--if not illusory--sense of independent functioning or autonomy that is unconditioned by interpersonal relations. Further, he claims that "they have mastery over their desires, and over jealousy and envy, because everything they think sufficiently valuable to be worth pursuing is such that its acquisition depends solely on themselves" (p. 385). Also, "they have very little esteem for everything that depends on

others" (p. 385). Consequently, they are not easily injured by their enemies. "All who conceive a good opinion of themselves for any other reason, whatever it might be, do not possess true generosity, but only vanity which is always a vice" (p. 385).

Descartes (1649) makes an important distinction between the movements of the spirits within vain and vicious characters and those who possess true generosity. *Moral constancy is always accompanied by an experience of physiological constancy and bodily absence. And it is from the absence of the body from conscious experience that Descartes infers an immaterial mind protected from the external threats of fortune and others.* "It is easy to see that vanity and abjectness are not only vices but also passions. For their emotion is quite apparent in the demeanour of those who are suddenly elated or depressed by some new happening" (p. 386). Moral inconstancy or vanity and abjectness are a state of character in which the soul passionately undergoes or suffers the activity-disrupting presence of the body in conscious experience. The externally directed soul suffers and is controlled by the operation of bodily dispositions to be affected pleasantly or painfully since the actualizing conditions of these dispositions are caused by the gains and losses of external goods. The alternation between, perhaps, euphorically pleasant and depressingly painful episodes of bodily dys-appearance causes a corresponding waxing and waning of self-esteem. In the midst of action the suffering I or self recedes from ecstatic sensorimotor involvement (or the body "I am"); that is, during episodes of bodily dys-appearance lying at both poles of self-opinion, the body that "I have" emerges in awareness as a problem to be solved. Action is thereby impeded--if not paralyzed. Since they have no internal compass, the self-opinion and emotional stability of vain and vicious characters is determined entirely by the environment. The property of surprise is "found much more in vanity and abjectness than in generosity and humility of the virtuous kind" (p. 387). And "for this reason their passion involves a variable [inconstant] movement of the spirits" (p. 387). The movements of generosity and humility are "firm and always very similar to each other [constant]. But these movements are not due so

much to surprise, because those who esteem themselves in this way are well-acquainted with the cause of their self-esteem" (p. 387). That is to say "the power to make use of our free will . . . causes us to value ourselves" (p. 387). Self-knowledge affords one an unambiguous and stable or constant source of self-esteem, emotional stability, and capacity for desire that is not easily immobilized by the unexpected. Other people cannot deprive one of such an internal good.

Because the movements of the spirits and changes in demeanor of the virtuous soul are more constant and less apparent than those of the vicious, "it seems that virtue is not so closely associated with passion as vice is" (Descartes, 1649, p. 386). Virtuous affective states exhibit greater self-effacing transitivity. Descartes distinguishes passions from internal emotions. Passions such as joy or sadness are caused by immediate sensations of pleasure and pain, and desires to pursue or avoid are aroused by these passions. The passions happen to the soul, whereas the internal emotions are actions of the soul. The causal order is reversed: sensations cause passions in the soul, whereas judgment causes internal emotions. Any affective state could be a combination of a passion and an internal emotion, a mixture of irrational and rational emotion. Descartes (1649) says that "our well-being depends principally on internal emotions which are produced in the soul only by the soul itself. In this respect they differ from its passions, which always depend on some movement of the spirits" (p. 381). True judgments of good or bad therefore precede and cause internal emotions such as love or hate. First, these internal emotions are, even more than exercise of virtue, a source of happiness that are invulnerable to harmful external influences. Provided "our soul always has the means of happiness within itself, all the troubles coming from elsewhere are powerless to harm it" (p. 382). Also, because Descartes presumes that internal emotions operate independently of the movement of the spirits, they, according to the concept of lived embodiment that I have been using, coincide with the occurrence of the disappearing body. And as I have been arguing, Descartes identifies activities that exhibit a high level of bodily absence

with the (supposedly) immaterial soul. *Moral constancy is thereby derived from the same source as cognitive certainty.*

Let us review and summarize in order to help clarify the distinction between the passions and internal emotions. On the one hand, a passion, by definition, is opaque to the understanding, suffered by or imposed upon the soul, and is felt as a physiological disturbance, or what Leder has conceptualized as a mode of bodily dys-appearance or the body that "I have." Recall that passionate responses draw attention inward and tend to be disproportionate with the actual harm or benefit that objects or others impose or afford. They tend to polarize and exaggerate the preexisting ambiguities of external goods. Under extreme conditions the disclosure of bodily presence in awareness displaces disclosure of the world. On the other hand, an internal emotion, by definition, is as self-effacing and world-disclosive as an affective state can be. That is to say, it is functionally unified with the soul's best judgment and optimally proportional with the actual harm and benefit that objects or others afford. It is transparent to the understanding. Internal emotion should exhibit a high level of focal disappearance, surpassing that of all other subjective states except those of pure understanding. The acting thinker is ecstatically engaged in unimpeded or flourishing sensorimotor activity. The "I think," the "I can" and the "it can" are functionally coordinated and integrated in the body that "I am." Internal emotions are fully rational and intentional. And since the mind that is regulated by internal emotions is away from the body or ecstatically engaged with the world, the lived body occupies no more than the outer margins of experience. *Descartes is aware that the movements of the spirits are not felt by the mind in a morally constant condition, so he theoretically dissociates this disappearing mode of lived-embodiment from physiological activity or lived-embodiment.* In other words, from the structure of lived embodiment he infers a mind-body dichotomy, an immaterial mind and material body.

The Cartesian concept of mind and moral psychology carries a number of important implications about education. Learning style and principles are purely

cognitive. An autonomous and isolated individual thinker or meditator who operates according to abstract, timeless principles that are unconditioned by the particulars of ordinary experience and other people is the kind of character that Cartesian educators would aim to produce. The development of abstract and general cognitive skills is the single-most important learning goal. While action and emotion are important, the understanding is the sole source of authority and principles for action and affect. In a popular teacher education text, Christine Bennett (1999) expresses assumptions common among educationists when she claims that individuals can be reliably differentiated according to styles of learning that transcend content. For instance, insofar as individuals are "intrinsically motivated" and "unresponsive to social reinforcement," they are not "extrinsically motivated" and "responsive to social reinforcement" (p. 182). Although this principle implies or, at least, suggests that some students would have the same interest in all subjects, I doubt that there has ever been such person. Descartes would probably hold the same doubt; however, Bennett's sliding scale of motivation that is reducible to a dichotomy of opposed inner and outer causal powers (whereby one regulates action more than the other) is agreeable to the Cartesian concept of mind and motivation. As I have shown, Descartes urges us to establish an inner locus of control that operates according to principles that transcend specific contexts. Bennett's "field-independent" learners greatly resemble Descartes' autonomous and isolated thinker. Both are "good at abstract analytical thought," disposed to favor "'inquiry' and independent study," (p. 182), and both like to deal with "math and science concepts" according to the "discovery approach" (p. 185). Bennett also says that field independent learners, being intrinsically motivated, are "unresponsive to social reinforcement," "insensitive to others," and have "poorly developed social skills" (p. 182). Descartes would not agree entirely. He does advise us to ingratiate ourselves to others for crudely utilitarian purposes.

Descartes does not prefer a utilitarian approach to other persons for he repeatedly claims that our happiness and well-being must not depend on others. We must learn to desire only what depends on us alone. The implication is that we should not desire other people and that anyone who is true to Cartesian moral principles could not be very sociable.

> For generosity causes us to hold in low esteem all the good things which may be taken away, and on the other hand to hold in high esteem the liberty and absolute control over ourselves which we cease to have when someone else is able to injure us. (Descartes, 1649, p. 401)

Although the body is a base for the operations of the self, Descartes conceives of it largely as an opponent to which the self is vulnerable. Likewise, although the cultural sphere is also a base for the self, he conceptualizes interpersonal relations largely as threatening to the integrity of the self. The steadfast pursuit of virtue, in contrast to the *destabilizing* pursuit of interpersonal security, disposes the soul to achieve "self-satisfaction," a condition of emotional "tranquility" and "peace of mind" (Descartes, 1649, p. 396). And even though in places he acknowledges the significance of social relations, their value is nearly eclipsed by the claimed significance of isolated-autonomous thinking. Later chapters of this study will show why this kind of autonomy is more apparent than real.

Instruction and learning in both mathematical subjects and character development is conceptualized as detached from bodily motion and action.

> Moreover, if we occupy ourselves frequently in considering the nature of free will and the many advantages which proceed from a firm resolution to make good use of it--while also considering, on the other hand, the many vain and useless cares which trouble ambitious people--we may then arouse the passion of generosity in ourselves and then acquire the virtue. (Descartes, 1649, p. 388)

Because the Cartesian body is conceived to be an unthinking automaton, embodied dispositions to act and be affected are also in principle *not* intelligent. Consequently, the I or self must always recede from sensorimotor engagement or bodily movement and

withdraw into purely cognitive meditation in order to reorganize irrational bodily habits or dispositions. The understanding serves to organize action, but never the other way around. Consequently, all subjects and forms of practice, insofar as they can be taught, are probably best taught by lecture to students who operate independently of one another, and are probably best learned by solitary reading or other kinds of independent study. Learning and teaching should neither emphasize nor rely on social interactions between students. Perhaps Descartes' obligation to the world of mathematical concepts outweighs his obligation to the life-world. In any case, it follows that theory informs practice but not the reverse and that a division of labor between theoretical activity and practice should be maintained. The emphasis seems to always be on social division or separation among people rather than communication and unity.

CHAPTER 3
HUME ON SOCIABILITY: COGNITION, PASSION, AND ACTION

The therapeutic goal implied by Hume's *Treatise of Human Nature* is to direct solitary abstract thinkers to the experiential basis of mathematical and other truths and to satisfactions that lie beyond the meager revelations of abstract reflection. Participation in interpersonal relations and related activities integrate the mind and body and thereby forms a self or *whole* human being. Ultimately, the projected achievement defines the individual person almost exclusively in terms of other people or social influences. Thus, individual and social identity may be difficult to distinguish. The source of emotional stability and moral constancy with respect to significant patterns of acting and feeling is not the timeless principles of abstract reason or understanding but socially constructed standards and customs.

According to Hume a coherent concept of a continuously existing and morally constant personal identity cannot be based solely on the integrated operations of the senses, understanding, imagination, and memory of the immobile, *solitary*, and abstract thinker who passively observes the operations of the world. Cognitive processes by themselves exhibit neither continuity nor constancy. A coherent concept of a continuously existing self must also be grounded in the functioning of interpersonally communicated passions. Passions imply continuity. The continuous operation of emotional-intent or desires that are qualified by particular passions move the human organism or body toward long- and short-term desired goals. Exploratory movement and goal-directed action proceed according to the operation of passion and desire and a living body. A coherent concept of a morally constant, emotionally stable, and continuously

existing self must be based on character formation that is directed by socially constructed standards for personal conduct.

The thesis of this chapter, according to my interpretation of Hume's *Treatise*, is that *a coherent concept of mind cannot be reduced to cognitive processes alone but must also be grounded in the operations of an active and whole living person who participates in and whose character must be nourished by morally directed interpersonal relations.*

Let us briefly examine the general organization and content of this chapter. There is a three-part progression. A progression may not be easy to notice if one is not looking for it. First is Hume's account of the isolated and immobile cognitive system. The implied orientation is largely introspective and reflective. The emphasis is on the body "I have." Second, Hume implicitly situates the principles of the cognitive system in the emotional and action systems. While he develops an explicit account of the emotions or passions, various forms of action are taken for granted. There is an implicit shift in emphasis to a common-sense orientation and the body "I am." Action and passion are essential for interpersonal communication. The self is constructed through interpersonal communication. Third is a brief account of morality. Morality determines the direction of character formation. From this discussion emerges, fourth, a short discussion of education.

Although Hume's psychological investigation into the epistemological operations of the autonomous individual person (like Descartes') does presuppose a perceiving "I" absent from its own conscious experience, he never (unlike Descartes) makes an ontological inference of the existence of an immaterial self. Whereas Descartes attempts to conceptualize the thinking self or "I," that cannot be pictured in the imagination, exclusively in terms of the absences exhibited by the structure of lived-embodiment and that same self's operations in terms of what exhibits the absolute minimum of concrete, sensory presence, Hume attempts to establish the basis of individual cognitive powers much closer to the opposite, more concrete pole of embodied experience. Recall that the

ultimate cognitive achievement of the Cartesian self is the intellectual-perception of timeless or idealized abstractions during which the self must recede as far as possible from the sensorimotor surface of the body. For Hume, the most basic and important cognitions ultimately imply more sensorimotor surface involvement accompanied by a *felt* sense of one's own interactions in a physical or natural world.

Hume teaches us to doubt the existence of immaterial objects that are supposed to cause or give true meaning to immaterial cognitions or perceptions. We should infer neither an immaterial self nor immaterial objects from what lies beyond all possible experience. By Hume's time, Cartesian principles of intellectual-perception of intellectual objects were transferred to accounts of veridical perception of concrete objects of ordinary or qualitative experience. Perception of concrete or qualitative objects was transformed into a conceptual thought process.

> Many of the early modern philosophers were convinced that the immediate object of the mind is always something mental or internal to the mind. . . . The philosopher's thesis was that, whenever we think we see an external object, the immediate object of our minds is a mental representation of that external object. Thus, when I think I see a tree, I am in fact experiencing only a mental representation of that tree. (Norton, 2000, p. 16)

This thesis is not about what ordinary people think or believe about their own awareness and experience but about how any mind works. To be more specific, an internal mental or intellectual representation is supposed to represent an external object that unifies, organizes, and lawfully regulates the many otherwise inadequately formed or unformed particulars of concrete appearances that cannot be clearly distinguished from features of one's own subjectivity. Since non-thinking external objects are reducible to propositions that describe objects in terms of quantified extension and rules for the construction and transformation of geometrical form, they are clearly distinguished from and defined as independent of and external to the non-extended and non-spatial, thinking mind or self.

One problem with perception as representation, for Hume, is that a perception that we do experience is supposed to be caused by a simultaneously operating and existing external object that in principle we *cannot* feel or experience in any way. Our perceptions may thereby conceal the world and reveal only themselves. Were such essentially unverifiable perceptions to completely misrepresent the world, one would have no way of knowing the difference. The cause or external object and the effect or object-representation are defined exclusively in terms of very general and abstract conceptual meanings. In virtue of the meanings of the terms and implicit or explicit rules of inference, a cause logically and necessarily implies its effect. Recognition of such a so-called cause is purely an act of the intellect or understanding.

Hume reconceptualizes the cause and effect relation in terms of successive or temporal order instead of the extra-experiential, purely simultaneous or timeless order that Descartes identifies with the absences of lived-embodiment. With cause and effect redefined as a before and after or temporal relation, the worrisome dichotomy between external objects (causes absent from any possible experience) and co-present, co-existing internal object-representations (experientially present effects) and the implied problem of unverifiability (external world skepticism) are no longer an important issue. Let us digress briefly to examine Hume's taxonomy. There are two kinds of perceptions: impressions and ideas. An impression "arises in the soul originally, from unknown causes" (Hume, 1740, p.7). All "our simple ideas in their first appearance are deriv'd from simple impressions, which are correspondent to them, and which they exactly represent" (p. 4). Of the "impression there is a copy taken by the mind, which remains after the impression ceases; and this we call an idea" (p. 7). Hume (1740) says that

> 'tis universally allow'd by philosophers, and is pretty obvious of itself, that nothing is ever really present with the mind but its perceptions or impressions and ideas, and that external objects become known to us only by those perceptions they occasion. To hate, to love, to think, to feel, to see; all this is nothing but to perceive.

> Now since nothing is ever present to the mind but its perceptions, and since all ideas are deriv'd from something antecedently present to the mind, it follows that 'tis impossible for us to so much as to conceive or form an idea of anything specifically different from ideas and impressions. (p. 67)

That is to say, we cannot form an objective or non-illusory idea of what we have never experienced. At first it may appear that "since nothing is ever present to the mind but its perceptions" Hume is defining qualitative experience exclusively in *inner* psychological terms. A closer look will show that he attempts to eliminate the dichotomy between exclusively psychological or internal perceptions and external objects or references to objects that lie beyond experience. "The farthest we can go toward a conception of external objects when supposed *specifically* different from our perceptions, is to form a relative idea of them, without pretending to comprehend the related objects" (p. 68). Such objects have no practical or empirical meaning and therefore lie beyond our temporally conditioned powers of comprehension.

Empirically defined causal relations, the basis of probable or inductive reasoning, do not presuppose the existence of "external" objects. Let us briefly examine the concrete, mechanical model that underlies Hume's concept of the probable reason and the formation of belief through habit or custom. Hume (1740) says,

> Here is a billiard-ball lying on table, and another ball moving toward it with rapidity. They strike; and the ball, which was formerly at rest, now acquires motion. This is as perfect an instance of the relations of cause and effect as any which we know, either by sensation or reflection" (p. 649)

From the anticipated shock we infer that the second ball will acquire motion. According to Hume three causal relations and the relation of resemblance are the foundation of causal inferences. The first relation is *contiguity* in time and place. The two balls touched before the second acquired motion. The second relation is *priority* in time. A cause must precede its effect. The third relation is *constant conjunction*. We have seen the *same* cause precede the *same* effect with sufficient frequency during a sufficient number of *resembling* instances that upon seeing the cause we determined to infer the effect will be

next or that upon seeing the effect we are determined to infer the cause preceded. Hume explains that

> *When I see a billiard-ball moving towards another, my mind is immediately carried by habit to the usual effect, and anticipates my sight by conceiving the second ball in motion.* But is this all? Do I not but CONCEIVE the motion of the second ball? No surely. I also BELIEVE that it will move. What then is this *belief*? And how does it differ from the simple conception of any thing? (p, 652, capitalization is in the original)

A belief is a "*stronger* . . . more *lively*, a more *vivid*, a *firmer*, or a more *intense* conception," and "it has a more forcible effect on the mind than fiction and mere conception" (p. 654). For example, "poetry, with all its art, can never cause a passion, like one in real life. It fails in the original conception of its objects, which never *feel* in the same manner as those which command our belief and opinion" (p. 654). Conceiving of abstract objects in the imagination probably exhibits even less of the forcible, lively feeling. Hume places a strong emphasis on the "lively feeling" of a belief or opinion (p. 655). An "opinion . . . or belief may be most accurately defined, A LIVELY IDEA RELATED TO OR ASSOCIATED WITH A PRESENT PERCEPTION" (p. 96, capitalization is in the original). Also, a belief is a "peculiar feeling or sentiment" (p. 655). Again, this felt liveliness implies an embodied component and suggests an emotional component, perhaps a calming sense of physical or interpersonal security that displaces anxiety about some situation as it becomes more settled or certain.

As belief becomes more settled and secure, resolution displaces irresolution. A well-grounded feeling of confidence about what preceded or what will follow the present moment has significant pragmatic implications. Baier (1991) says that for Hume "experience saves us, when deductive reason lets us down" (p. 56). Hume (1740) explains,

> 'Tis . . . by EXPERIENCE only that we can infer the existence of one object from the other. The nature of experience is this. We remember to have had frequent instances of one species of objects; and also remember, that the individuals of another species of objects have always attended them, and

> have existed in a regular order of contiguity and succession with regard to them. Thus we remember that species of object we call *flame*, and have felt that species of sensation called *heat*. We likewise call to mind their constant conjunction in all past instances. Without ceremony, we call one cause and the other effect, and infer the existence of one from the other . . . in all cases . . . one perceiv'd or remember'd and the other supplied in conformity to past experience. (p. 87, capitalization is in original)

"We are determined by CUSTOM alone to suppose the future conformable to the past" (p. 652). It is impossible to

> *demonstrate*, that the course of nature must continue uniformly the same, and that the future must be conformable to the past. . . . This conformity is a *matter of fact*, and . . . will admit of no proof but from experience. But our experience in the past can be a proof of nothing for the future, but upon a supposition, that there is a resemblance betwixt them. This therefore is a point, which can admit of no proof at all, and which we take for granted without any proof. (p.652)

So custom alone determines this pragmatic supposition to transfer the past to the future. "'Tis not, therefore, reason, which is the guide of life, but custom" (p. 652).

Without the frequent conjoining of successively ordered cause and effect in a sufficient quantity of instances related to one another by resemblance, we do not form an idea or concept of causal power or necessary connection between cause and effect. For Hume, the concepts of necessity and, perhaps, cognitive certainty are not made possible by principles of demonstrative or mathematical reasoning but by repeated similar experiences. Hume (1740) says that

> There is no object, which implies the existence of any other if we consider these objects in themselves, and never look beyond the ideas we form of them. Such an inference would amount to knowledge, and would imply the absolute contradiction and impossibility of conceiving anything different" (p. 87)

For Hume "knowledge" refers to the products of demonstrative reason or purely conceptual thought, expressed, for instance, in subjects like mathematics, geometry, or formal logic. He draws a sharp contrast between what we may infer from conceptual meanings already known and inferences grounded in the ongoing successive order of

experience. If from the "here" and "now" of immediate sensory experience we infer and believe that an object of perception is caused by a co-present and co-existing external object that lies "out-there" or wholly beyond experience, then our inference and supposed belief cannot be founded on experience and must be based solely on conceptual thought and meaning. According to Hume, "reason alone can never give rise to any original idea" (p. 157).

Upon viewing the premises of a demonstrative argument but once, if we understand what we see, we can make a valid inference without much--if any--further thought and no reference to qualitative experience. Demonstrative reasoning, which depends on the voluntary reflective comparison of ideas, judges the status of its arguments and objects largely--if not entirely--in terms of proper form or rules of inference and object construction. If, say, we already know that A implies B, and B implies C, then we also know that A implies C is a valid inference. Insofar as we already know the meanings of the terms and have some implicit or explicit grasp of the rules of inference, we can make the inference based on what we already know. Either we get the inference right immediately or we do not understand the argument. Without an adequate understanding, looking at a hundred or more instances will be of little or no help. In logic and mathematics, many new conclusions can be learned without necessarily discovering previously unknown existences.

Inferences of the existence of objects or actions of objects that lie beyond the immediate "here" and "now" of sensory experience can be justified *only* by repeated or multiple experiences of similar successions of objects. This is more a matter of specific facts than proper concepts or conceptual form. Hume (1640) says that "'Tis not . . . from any one instance, that we arrive at the idea of cause and effect, of a necessary connexion of power, of force, of energy, and of efficacy" (p. 162), and "'tis impossible in any one instance to shew the principle, in which force and agency of a cause is plac'd" (p. 159). A "multiplicity of resembling instances . . . constitutes the very essence of power or

connexion, and is the source, from which the idea of it arises" (p. 163). Only "causation," in contrast to what conceptual meanings imply, "produces such a connexion, as to give us the assurance from the existence or action of one object, that 'twas followed or preceded by any existence or action" (p. 74). And of "those three relations, which depend not upon mere ideas, the only one, that can be trac'd beyond or senses, and informs us of existences and objects, which we do no see or feel, is causation" (p. 74). In other words only causation that operates strictly in terms of successive order discloses what is other for the self. The human mind is away from the body by means of causal inferences. Whereas the Cartesian "I" projects itself upon the co-existing, co-present "theres" that surround it, the "I" or self of Hume's concept of cognition, from the "here" and "now" of immediate sensory experience, projects itself upon what "was" and what will be "next." But in fact "we never really advance a step beyond ourselves" (p. 67).

Hans Jonas (1966) helps us to understand the embodied roots that Hume's empirical reconceptualization of causal relations has drifted away from:

> But an unprejudiced examination will find that not the pure understanding but only concrete bodily life, in the interplay of its self-feeling powers with the world, can be the source of the "idea" of force and thus of cause. The understanding as such knows merely of reason and consequence, not of cause and effect: The latter denote a connection of reality, by means of force, not of ideality, by means of form. . . . Causality is thus not an a priori basis of experience, but itself a basic experience. That experience has its seat in the *effort* I must make to overcome the resistance of worldly matter in my acting and to resist the impact of worldly matter upon myself. This happens through and with my body, with its extensive outwardness and its intensive inwardness at once, with both are genuine aspects of myself. (p. 23)

Hume's account is somewhat ambiguous since his language or word choice often implies embodiment, whereas his explicit principles lead to a much more psychological interpretation of force or causal necessity. Because Hume describes causal relations largely in terms of the observation or visual perception of cause and effect rather than the

"effort" of embodied participation in them, the embodied roots of the idea of causal relations are concealed by too much attention to cognitive processes.

According to Jonas (1966) "Hume has shown that 'causation' is not found among the contents of sense perception. This is incontrovertible so long as 'perception' is understood, with Hume, as mere *receptivity* that registers the incoming data of sensation" (p. 26). Considered in terms of dual-unity of the structure of lived embodiment, of the intertwined operations of what is absent from and present to thematic awareness, the purely successive order of causal activity and the purely simultaneous order of passive perception, conceived largely in terms of a kind of immobile stare or gaze, are mutually exclusive. The implicit lack of motility so frequently exhibited in Hume's concept of probablistic cognition suggests the empirical reality of such a condition. A stationary spectator does not *feel* the dynamics of causal forces as clearly and intensely as someone who is in motion. Once the self become active or engages in exploratory movement, the dynamics of causal activity can emerge as thematically present to awareness or perception. But Hume's *recurring implicit assumption of inactive and stationary or passive receptive visual perception is what makes causal necessity appear as an inner psychological phenomenon.* The mind alone is left to integrate what is present to and absent from thematic awareness. Hume (1740) says the idea or concept of causal power, agency, force, efficacy, energy, necessity, or necessary connection between objects

> arises from some impression. There is *no impression convey'd by the senses*, which can give rise to that idea. It must, therefore, be deriv'd from some internal impression or impression of reflexion. There is no internal impression, which has any relation to the present business, but that propensity, which custom produces, to pass from an object to an idea of its usual attendant. This therefore, is the essence of necessity. Upon the whole, necessity is something, that exists in the mind, not in objects. (p. 156, italics added)

In other words, necessity is largely an inner psychological matter or "nothing but a determination of thought to pass from causes to effects and from effects to causes" (p.

166). Since there is no sensation-based "impression" or perception from which the idea of necessity can arise, its source must be internal to the self. The "customary transition" through which the mind passes from a present impression of the "senses" to a lively or forcible conception of its usual associate is "the same with power and necessity." Power or necessity is a quality of an internal impression or perception "not perceiv'd externally in bodies" and "not of objects" but "internally felt by the soul" (p. 166). Upon viewing, visually perceiving, or observing a sufficient quantity of constantly conjoined, successively ordered, and spatio-temporally contiguous cause and effect object pairs, the resulting effect is the formation of a "propensity," habit, or disposition of mind whereby the integrated acts of the association prone, dynamic imagination and the static concept-forming and idea-projecting understanding cause the formation and projection of the concept or idea of necessity. Here we have an expression of the dual-unity of lived embodiment whereby the dynamics of the imagination that are largely absent from explicit awareness and the static concepts of the understanding that exemplify conscious presence are unified largely in terms of cognitive activity.

The perfection of habit leads the mind to project an illusion of constancy or cognitive certainty on a natural world of imperfect but reliable, mind or idea independent probability. The point is not that the mind constructs its own metaphysical reality or that its operations are wholly disconnected from the natural or physical world but that successively ordered natural or physical regularities cause or produce corresponding internal psychological constancies or, perhaps, cognitive certainties that specify but are not copies of the perceived or natural order. Our skepticism should be determined or moderated by the pragmatic significance of the unperceived disparity or divergence. Hume (1740) says that

> the operations of nature are independent of our thought and reasoning. I . . . have observ'd, that objects bear to each other the relations of contiguity and succession; that like objects may be observ'd in several instances to have the relations; and that all this is independent of, and

> antecedent to the operations of the understanding. But if we go any farther, and ascribe a power or necessary connexion to these objects; this is what we can never observe in them, but must draw the idea of it from what we feel internally in contemplating them. (p. 169)

Since "contiguity" and "succession" are defined by Hume as object-dependent and idea- or mind-independent relations, they should operate and exist independent of observation and conceptual thought. And a sufficient quantity of instances must be observed before the "operations of the understanding" form an idea of "necessary connexion." This passage also *suggests* the embodied roots of epistemological necessity since we "feel internally" the force of a cause. *Feeling* a force "internally" suggests the immediate or spatio-temporally contiguous apprehension of one's own visceral depths or bodily sensations as the world acts on oneself internally and externally and as one simultaneously acts on the world. Such feelings are immediately felt in the sense that there is little or no distance of any kind between oneself and the interactions of internal and external physical forces (i.e., gravity and centrifugal force) so that, in this mode of bodily appearance, subject and object can be perfectly unified. By contrast, the concept of observation or visual perception necessarily implies a degree of detachment or distance by means of which experiences of subject-object interactions and object ambiguity are both minimized--if not eliminated.

Resemblance, conceived as a natural relation between distinct instances of cause and effect, may be the most basic element of Hume's account of necessary connection. Hume (1740) explains that

> There is . . . nothing new either discover'd or produc'd in any objects by their constant conjunction, and by the uninterrupted resemblance of their relations of succession and contiguity. But 'tis from this resemblance, that the idea of necessity of power, and of efficacy, are deriv'd. These ideas, therefore, represent not anything, that does or can belong to objects, which are constantly conjoined. . . . Similar instances are still the first source of our idea of power or necessity. At the same time that they have no influence by their similarity either on each other, or on any external objects. (p. 164)

Without recognition of resemblance, causal inference, belief, and probability are not possible. Probability is "founded on the presumption of a resemblance betwixt those objects, of which we have had experience, and those, of which we have had none; and therefore 'tis impossible this presumption can arise from probability" (p. 90). "As belief is an act of mind arising from custom, 'tis not strange the want of resemblance shou'd overthrough what custom as established, and diminish the force of the idea, as much as the latter principle encreases it" (p. 114).

Since the mind's ability to recognize resemblances between distinct instances, that by themselves imply nothing, is the basis from which "the idea of necessary power, and efficacy, are deriv'd," the mind and experience play a complementary role in forming the concept of necessary connection (Hume, 1740, p. 114). Perhaps the innately restless, association-prone imagination sets the standard for resemblance and also determines which resemblances are worthy of attention. Of course, without experience of past conjunctions there is nothing for a present instance to resemble.

Hume (1740) explains,

> 'Tho the several resembling instances, which give rise to the idea of power, have no influence on each other, and can never produce any new quality in the *object*, which can be the model of that idea, yet the *observation* of this resemblance produces a new impression *in the mind*, which is the real model. For after we have observ'd the resemblance in a sufficient number of instances, we immediately feel a determination of the mind to pass from one object to its usual attendant, and to conceive it in a stronger light upon account of that relation. This determination is the only effect of the resemblance; and therefore must be the same with power or efficacy, whose idea is deriv'd from the resemblance. (p. 165)

Since objects cannot imply an impression of necessity or power, Hume looks toward the dynamic and successively ordered aspect of constantly conjoined objects. The "*observation* of this resemblance" causes the mind to form an idea or concept of necessary connection. "Necessity" is the "effect" of the "observation" of "resemblance" (p. 165). *Now* resemblance, the origin of the idea or concept of necessary connection, *can*

be "observ'd" (p. 165). Earlier I showed a possibly contradictory claim: "There is no impression convey'd by our sense, which can give rise to that idea" (p. 165). But if resemblances between successive instances are "totally distinct" from each other, "resemblance" is defined as a purely natural and dynamic kind of relation, and if resemblance is observable, then perception, at least in this particular instance, is not sensation-based passive-reception, but instead is an active, exploratory movement-based recognition of the temporally conditioned relations among sensations. Perception would thereby integrate momentary and ontologically distinct moments of presence with the successive and dynamic order of experience, and causation thus emerges into conscious awareness. Here we have an implicit recognition of lived embodiment, that is, of the lived dual-unity of what is present to and absent from awareness. But since "These instances are in themselves are in themselves totally distinct from each other, and have no union but in the mind, which observes them, and collects their ideas" (p. 165), it seems that the continuous and unified reality of the self is the product of psychological construction processes. The problem is that the subject-object disunity that Hume prefers to avoid emerges again in his concept of mind. The ambiguous implications may have been eliminated had Hume developed a more technical vocabulary. In Hume's account, the idea of necessity is projected on idea or mind independent objects. The "mind has a great propensity to spread itself on external objects, and to conjoin with them any internal impressions, which they occasion, and which always make their appearance at the same time that these objects discover themselves to the senses" (p. 167). Hence the integrated operations of the understanding, imagination, and senses operate primarily to execute acts of transference and projection.

Although Hume's concept of mind, in places, suggests disembodied cognitive construction processes, it also exhibits many claims to the contrary. Hume (1740) explains that probable or inductive

> reason is nothing but a wonderful and unintelligible instinct in our souls. . . . This instinct, 'tis true, arises from past observation and experience; but can any one give the ultimate reason, why past experience and observation produce such an effect, any more than nature alone should produce it? . . . habit is nothing but one of the principles of nature, and derives all its force from that origin. (p. 179)

The formation and operation of fully formed habit and belief therefore are opaque to the light of unreflective intellectual power and operate according to the same principles as the natural order does. Also, "the uniting principle among our internal perception is as unintelligible as that among external objects, and is not known to us any other way than by experience" (p. 169). Hume also emphasizes the feeling component of a fully formed belief. All

> probable reasoning is nothing but a species of sensation. 'Tis not solely in poetry and music, we must follow our *taste and sentiment*, but likewise in philosophy. When I am convinc'd of any principle, 'tis only an idea, which strikes more strongly upon me. When I give the preference to one set of arguments above another, I do nothing but decide from my *feelings* concerning the superiority of their influence. [P]ast experience . . . may operate on our mind in such an insensible manner as never to be taken notice of, and may even in some measure be unknown to us. (p. 103, italics added)

We are not aware of the operation of a fully formed or perfected habit for at least two reasons. First, the operation of a perfected habit or disposition implies that attention is directed outward beyond the "here" and "now" of immediate sensory experience. We are thus "insensible" of our own sensorimotor surface and visceral depths while the mind is away from the body. The operation of an imperfect habit implies attention is drawn inward, a condition I have referred to as depth and sensorimotor surface dys-appearance. Insofar as a habit is imperfect, disclosure of one's own body displaces disclosure of what lies beyond it. This "imperfection is very sensible in every single instance" (p. 110) until the habit is adequately formed. Second, we weigh the influence of opposed "arguments" based on qualitative "feelings" that are not reducible to propositions or concepts of the understanding. Such feelings, according to Hume, are opaque to the reflective light of

intellectual-perception or objective cognition and therefore are to some extent "unknown to us." We have no articulate or explicit interpretation of them that offered some degree of objective distance. Experience "may produce a belief and a judgment of causes and effects by a secret operation, and without once being thought of" (p. 104). Such judgments proceed "without choice or hesitation" (p. 110). The operation of habits generally oppose or proceed uninfluenced by direct acts of will.

We are generally "insensible" of the operation of a belief since it is the outcome of a self-effacing, integrated act of imagination and understanding. Although the cognitive component of judgments of cause and effect, belief, or perception may be absent from awareness, we may be "sensible" of the presence of an integrated, felt aesthetic component. In this respect, "belief" is a "peculiar feeling or sentiment" (Hume, 1740, p. 655). This aspect of belief is a felt mode of bodily appearance that corresponds to the qualities of some object or action insofar as one is attuned to them. In his essay *Of the Standard of Taste* Hume (1741) refers to such attunement as "delicacy of taste" (p. 240) or "*delicacy* of imagination" (p. 239). Hume tells a short story about two wine experts. After tasting some wine, they both proclaim it to be excellent, except one detects a "small taste of leather" and the other a "taste of iron" (p. 239). Both were ridiculed for their judgment. But on "emptying the hogshead, there was found on the bottom an old key with a leathern thong tied to it" (p. 240). There is a "great resemblance" between "mental" taste or sentiment and "bodily" taste; both please or displease our aesthetic sensibility. Beauty and deformity are terms that Hume generally reserves for objects of mental or psychological taste. Here we have a kind of non-analyzable, non-propositional, unconscious, or felt component of objectivity. Hume (1741) explains,

> Though it be certain that beauty and deformity, more than sweet and bitter, are not qualities in objects, but belong entirely to the sentiment, internal or external, it must be allowed that, there are certain qualities in objects which are fitted by nature to produce those particular feelings. (p. 240)

The ability to detect "minute qualities" (p. 240) or the ability to be "affected" by "minute objects" (p. 241) requires "*practice*" (p. 242). In other words, intelligently directed habit or custom modifies the capacity of one's organs of perception and intellect for discernment. Of course, particular organs and the organism as a whole must also be in a healthy state. "In each creature there is a sound and a defective state; and the former alone can be supposed to afford us a true standard of taste and sentiment" (p. 238). Practice can improve the capacity of an organ's sound state; that is to say, sensations that are otherwise felt as vague, obscure, or ambiguous, through practice, are discerned more *clearly and distinctly*. Hence, *the living body exhibits intelligence that can be improved through learning*. There is a "great resemblance between mental and bodily taste" because *both disclose the structure and qualities of an objective world.*

Hume's preference for subject-object unity in the context of empiricism's presupposition of the fundamental discontinuity both of experience and material existence yields some perplexing and paradoxical results for his account of a mind independent, external world. Hume (1740) says, "We may well ask, *What causes induce us to believe in the existence of body?*, but 'tis vain to ask, *Whether there be body or not?* That is a point, which we must take for granted in all our reasonings" (p. 187). *Hume's purpose is therefore not to prove the existence of an external world but to describe the process whereby belief in mind independent or external objects is produced.* That is, how am I "naturally led to regard the world as something real and durable, and as preserving its existence, even when it is no longer present to my perception" (p. 197)? The first step is to show "Why we attribute CONTINU'D existence to objects, even when they are not present to the senses; and why we suppose them to have an existence DISTINCT from the mind and perception" (p. 188, capitalization is in the original). In other words, why do we believe in their "*external* position as well as the *independence* of their existence and operation (p. 188)? Put differently, why do we believe that objects exist when we are not perceiving them? Hume defines three distinct kinds of perception. First are those of

"figure, bulk, motion and solidity of bodies"; second are "those of colours, tastes, smells, sounds, heat and cold"; and third are those of "pains and pleasures" and "passions" (p. 192). Hume describes all three as being "the same in the manner of their existence" (p. 193). The "senses . . . convey to us nothing but a single perception and never give us the least intimation of anything beyond" (p. 189). Single perceptions do not justify inferences of a "double existence" (mental object-representations and represented objects) (p. 189). Philosophy or reflective reason "informs us, that every thing, which appears to the mind, is nothing but a perception, and is interrupted, and dependent on the mind" (p. 193).

The supposed difference between internal perceptions and external objects, Hume (1740) says is "founded neither on perception nor reason, but on the imagination" (p. 193). The imagination produces our belief in the continuous and distinct existence of an external world, a kind of illusory but practical disclosure. So the essential difference is that internal perceptions present to awareness a more regular change of content than presented by external perceptions.

> Our eyes cannot turn in their sockets without varying our perceptions. Our thought is still more variable than our sight; and all our other senses and faculties contribute to this change; nor is there any single power of the soul, which remains inalterably the same, perhaps for one moment. (p. 253)

We may "observe, that tho' those internal impressions, which we regard as fleeting and perishing, have also a certain coherence or regularity in their appearances, yet 'tis of a somewhat different nature, from that which we discover in bodies" (p. 195). Never is it necessary to suppose that passions, pains, or pleasures exist or operate "when they are not perceiv'd" (p. 195). Without the common sense supposition of mind independent existence, the regularity of ordinary experience would be frequently disrupted. Everyday life could not proceed. All

> those objects, to which we attribute a continu'd existence, have a peculiar *constancy*, which distinguishes them from impressions, whose existence depends on our perceptions. These mountains, and houses, and trees,

> which lie at present under my eye, have always appeared to me in the same order . . . and in the same uniform manner and change not upon account of any interruption in my seeing or perceiving them. This is the case with all impressions, whose objects are suppos'd to have an external existence; and is the case with no other impression, whether gentle or violent, voluntary or involuntary. (p. 195)

So in spite of my absence or the absence of my perception, the same order and manner of presentation is preserved.

> Bodies often change their position and qualities, and after a little absence or interruption may become hardly knowable. But 'tis observable, that even in these changes, they preserve a *coherence*, and have a regular dependence on each other; which is the foundation of a kind of reasoning from causation, and produces the opinion of continu'd existence. When I return to my chamber after an hour's absence, I find not my fire in the same situation, which I left it: But then I am accustom'd to other instances to see a like alteration produced in a like time, whether I am present or absence, near or remote. (p. 195)

The inference of the continued or uninterrupted existence of objects "from the constancy of our perceptions, like the precedent from their coherence, gives rise to the opinion of the *continu'd* existence of body, which is prior to that of its *distinct* existence, and produces that latter principle" (p. 199).

Continuous existence may transcend consciousness or awareness, whereas distinct existence transcends both awareness and the existence of any conscious or potentially conscious agency. Since, as Hume (1740) explains,

> Nothing is ever present to the mind, besides its own perceptions, 'tis not only impossible, that any habit should ever be aquir'd otherwise then by the regular succession of perceptions, but any habit should ever exceed that degree of regularity. Any degree, therefore, of regularity in our perceptions, can never be a foundation for us to infer a greater degree of regularity in some objects, which are not perceiv'd, since this supposes a contradiction, *viz*. a habit aquired by what was never present to the mind. But 'tis evident, that whenever we infer the continu'd existence of the objects of sense from their coherence, and the frequency of their union, 'tis in order to bestow on objects a greater regularity than what is observ'd in our mere perceptions. (p. 197)

Although our observation or perception of objects can be interrupted by our absence while, say, "turning about our head, or shutting our eyes," we suppose connections between objects to be "perfectly constant" and "join'd by something, of which we are insensible" (p. 198). "That opinion must be entirely owing to the IMAGINATION (p. 193, the capitalization is in the original). The "imagination, when set into any train of thinking, is apt to continue, even when its object fails it, and like a galley put in motion by the oars, carries on its course without any new impulse" (p. 198). The imagination thus constructs the common-sense idea of and belief in the continuous presence of what is absent from awareness or perception.

The supposition of the continuous and distinct existence of objects not present to awareness also makes the idea of personal and object *identity* possible. According to Hume (1740), common sense or "vulgar" thought *supposes* perceptions to be our only objects, and at the same time *believes* in the continuous existence of mind independent matter.

> Now upon that supposition, 'tis a false opinion that any of our objects, or perceptions, are identically the same after an interruption; and consequently the opinion of their identity can never arise from reason, but must arise from the imagination. The imagination is seduc'd into such an opinion only by means of the resemblance of certain perceptions; since we find they are only our resembling perceptions, which we have a propension to suppose the same. This propension to bestow an identity on our resembling perceptions, produces the fiction of a continu'd existence; since that fiction, as well as the identity, is really false . . . and has no other effect than to remedy the interruption of our perceptions" (p. 209)

Resemblance is essential to the pragmatic illusion of uninterrupted or continuous identity, the basis of a kind of spontaneous defensive strategy against a sensible "uneasiness" produced by irregularity (p. 206).

> Resemblance facilitates the transition of the mind from one object to another, and renders its passable as if it contemplated one continu'd object. This resemblance is the cause of the confusion and the mistake, and makes us substitute the notion of identity, instead of that of related objects. (p. 254)

"The very nature and essence of relation is to connect our ideas with each other, and upon the appearance of one, to facilitate the transition to its correlative" (p. 204). "Our memory presents us with a vast number of instances of perceptions perfectly resembling each other, that return at different distances of time, and often considerable interruptions. This resemblance gives us a propension to consider these perceptions as the same" (p. 208). The continuous mind or idea independent existence of the *same* object over time is thus only an appearance produced or caused by a self-effacing act or operation of the imagination and memory. Because, in principle, apparent changes in objects or the relations between them, like causal power, are not observable or perceivable, we have little--if any--awareness of their operation. The mind passes from one object to another in a succession and "perceives not the change" (p. 203).

Now the Cartesian concept of *personal* identity is vulnerable to the same critique as object identity. Hume (1740) argues that since philosophers have begun to accept the principle "*that we have no idea of external substance, distinct from ideas of particular qualities*," this development "must pave the way for a like principle with regard to the mind, *that we have no notion of it distinct from particular perceptions*" (p. 635). But "most philosophers seem inclin'd to think, that personal identity *arises* from consciousness; and consciousness is nothing but a reflected thought or perception" (p. 635). Descartes conceives of consciousness, at is most abstract and self-effacing level, as the foundation of personal identity or the immaterial substance in which all of a person's particular modes of thought or perceptions are supposed to inhere. The Cartesian self or "I" plays the central role in the "from-to" structure of perception and motility and exhibits a level of focal disappearance surpassing that of all other organs or faculties of thought. Such a self is the element of the from-to structure that absolutely resists all efforts at thematization. Hume attempts to ground personal identity at the opposite pole of the dual-unity of lived embodiment. *If it cannot be thematized, it is simply not a component of Hume's concept of personal identity.*

> For my part, when I enter most intimately into what I call *myself*, I always stumble on some particular perception or other, of heat or cold, light or shade, love or hatred, pain or pleasure. I never catch *myself* at any time without a perception, and never can observe anything but the perception. When my perceptions are remov'd for any time, as by sound sleep; so long I am insensible of *myself*, and may truly be said not to exist. . . . If any one upon serious and unprejudic'd reflexion, thinks he has a different notion of *himself*, I must confess I can no longer reason with him. (p. 252)

According to Hume's argument the mind spontaneously executes its own defensive strategies in a manner not easily recognized by reflective or conscious thought. Hume (1740) explains that

> Now there being an opposition betwixt the notion of the *identity* of resembling perceptions, and the interruptions of their appearance, the mind must be uneasy in that situation, and will naturally seek relief from the uneasiness. Since the uneasiness arises from the opposition of two contrary principles, it must look for relief by sacrificing the one to the other. (p. 206)

Although the absences of sensory experience, according to reason, define the world as basically discontinuous and that the senses cannot disclose anything beyond what their immediately experienced operations specify, the mind accepts the conclusion of the imagination. Common sense thought is disposed to spontaneously provide its own form of remedy or therapy by presupposing a Cartesian-like interpretation of the dual-unity of lived embodiment and experience. Continuous identity is therefore taken for granted. Hume characterizes the reflective or philosophical therapy or "remedy" of the "opinion of double existence" as a "monstrous offspring of the two principles" of common sense (p. 215).

> The imagination tells us that our resembling perceptions have a continu'd and uninterrupted existence and are not annihilated by their absence. Reflection tells us, that even our resembling perceptions are interrupted in their existence and different from each other. This contradiction betwixt these opinions we elude by a new fiction, which is conformable to the hypotheses both of reflection and fancy, by ascribing these contrary qualities to different existences, the *interruption* to perceptions, and the *continuance* to objects. . . . Not being able to reconcile these two enemies, we endeavour to set ourselves at ease as much as possible, by successively

> granting to each whatever it demands, and by feigning the double existence. (p. 215)

Philosophers feign (in theory) but do not believe (in practice) in the two distinct orders of existence, the one representing mind, the other the represented world. "But however philosophical this new system may be esteem'd, I assert that 'tis only a palliative remedy, and that it contains all the difficulties of the vulgar system, with some others, that are peculiar to itself" (p. 211).

Hume (1740) describes a "dangerous dilemma" that his account of cognition has been unable to avoid. There is "a direct and total opposition betwixt . . . those conclusions we form from cause and effect, and those that persuade us of the continu'd and independent existence of body" (p. 231). The imagination is the primary principle in the production of both *justifiable* inferences about successively ordered causal relations and *unjustifiable* inferences of mind independent, distinct, and continuous objects; it therefore is a "principle inconstant and fallacious" (p. 265). "The memory, senses, and understanding are . . . all of them founded on the imagination, or the vivacity of ideas" (p. 265). Now the understanding might perform corrective measures, but when "the understanding . . . acts alone, and according to its most general principle," it "entirely subverts itself, and leaves not the lowest degree of evidence in any proposition, either in philosophy or common life" (p. 268). Reason is far too skeptical, whereas the imagination is not skeptical enough. We "have, therefore, no choice left but between a false reason and none at all" (p. 268).

For Hume, an excess of solitary philosophical reflection upon one's own cognitive operations can in itself be a problem requiring a remedy. Hume (1740) asserts that "carelessness and in-attention alone can afford us remedy" (p. 218). Hume's general conclusion is that the integrated operations of the senses, understanding, memory, and imagination cannot *by themselves* be a secure basis for a coherent concept of continuous

personal identity or epistemic constancy. Unhappy with the frustrating results of his lengthy, solitary investigation into cognition, he elaborates:

> Most fortunately it happens, that since reason is incapable of dispelling these clouds, nature herself suffices to that purpose, and cures me of this philosophical melancholy and delirium, either by relaxing this bent of mind, or by some avocation, and lively impression of my senses, which obliterate all these chimeras. I dine, I play a game of back-gammon, I converse, and am merry with my friends; and when after three of our hours' amusement, I wou'd return to these speculations, they appear so cold, and strain'd, and ridiculus, that I cannot find in my heart to enter into them any farther. (p. 269)

The social or interpersonal world is also where Hume goes to more securely ground his concept or idea of *continuous* personal identity.

> What then gives us so great a propension to ascribe an identity to those successive perceptions, and to suppose ourself possest of an invariable and uninterrupted existence thro' the whole course of our lives? In order to answer this question, *we must distinguish betwixt personal identity, as it regards our thought and imagination, and as it regards our passions or concern we take in ourselves*. (p. 253, italics added)

Our "passions or concern we take in ourselves" imply a basis for "invariable and uninterrupted" personal identity that lies beyond the operations of cognition. Generally, the operations of the passions imply the continuously operating emotional-intentions or passions and desires of both oneself and other persons. Together the continuity of the living body and its psychological organization and embodied interpersonal relations afford Hume's concept of the individual person a more coherent and secure foundation.

We should keep in mind that according to Hume's account of human nature, the social construction of the self is a *natural* process that is directed by the *artificial* conventions of morality and education. Individual self-esteem must be adjusted to the needs of society. One should also remember that, for Hume, world disclosive cognitive and affective states are always accompanied by hedonically qualified, felt modes of bodily presence or appearance that are themselves essential to the *full* disclosure of a world beyond the self. Every cognitive and affective state thus has its own unique feeling,

a felt mode of bodily appearance or thematic presence that is distinct from dys-appearance. *The thinking mind therefore is never completely away from the thinking or intelligent body*. This conclusion plays a larger role in his concept of the interpersonally oriented self than his account of cognition.

Hume's *Treatise* reflects an ambiguous evaluation of the Cartesian orientation. Recall that Cartesian self-knowledge is supposed to be of the absolute "here" of consciousness, around which all "theres" of cognition and perception must be arrayed. The I or self is the element of the from-to structure that absolutely resists any form of thematization. In principle the invisible "I" or ego is the kind of thing that cannot be known yet cannot be doubted either. Consequently, claims of the existence of a metaphysical, presocial self or an autonomous, immaterial substance that unifies and organizes an agent's particular thoughts can be difficult to evaluate. Pierre Gassendi addresses his objection to Descartes (1641) directly:

> The inference which you yourself drew in that Meditation was that there was nothing which you could perceive more easily or evidently than yourself. But since you neither have nor are capable of having any idea of yourself, should we not rather say that you can perceive anything at all more easily and more evidently than yourself?
>
> When I think about why it is that sight does not see itself and the intellect does not understand itself, it occurs to me that *nothing acts on itself*. Thus the hand (or tip of the finger) does not strike itself and the foot does not kick itself. Now if we are to become aware of something, it is necessary for the thing to act on the cognitive faculty by transmitting its semblance to the faculty or by informing the faculty with its semblance. Hence it seems clear that the faculty itself, not being outside itself, cannot transmit a semblance of itself to itself, and hence cannot produce any awareness of itself or, in other words, cannot perceive itself. Why do you think that the eye can see itself in a mirror although it cannot see itself in itself? It is because there is a *space between the eye and the mirror*, and the eye acts on the mirror, transmitting a semblance of itself onto it, so that the mirror in turn acts on the eye by sending its own semblance back to it. Show me a mirror that you yourself can act on in this way, and I promise you that, when it reflects your semblance back to you you will finally manage to perceive yourself--though not by direct but by a *reflexive* kind of cognition. *But since you cannot provide such a mirror, there is no hope of your knowing yourself.* (italics added, p. 204).

Hume would agree, since for him self-knowledge must be based on particular, thematic objects of awareness or perception. For Hume, the absence of one's body from the field of perception by itself implies nothing and is an unremarkable discovery. So Hume turns to the particulars of the causal order to search for the self. Hume (1740) says that

> *Des Cartes* maintained that thought was the essence of the mind; not this thought or that thought, but thought in general. This seems to be absolutely unintelligible, since every thing, that exists is particular: and therefore it must be our particular perceptions, that compose the mind. I say, *compose* the mind, not *belong* to it. The mind is not a substance,in which perceptions inhere. (p. 658)

But since Hume finds neither continuity nor epistemological coherence in the particulars of the body I have of the sedentary, isolated, and self-observing cognitive system, he turns to the world of action and interpersonal interaction and thereby adopts the orientation of the body I am. Now Hume conceptualizes the self in terms of the common-sense orientation or natural attitude. Again, the body is absent from the field of perception and action as well. The self is specified or disclosed by who there is to be perceived.

Hume (1740) agrees with Gassendi in a qualified sense, since he introduces us to an alternative kind of mirror: "In general we may remark, that the minds of men are mirrors to one another, not only because they reflect each others emotions, but also because those rays of passions, sentiments, and opinions may often be reverberated, and may decay away by insensible degrees" (p. 365). Notice the dual cognitive metaphor that suggests dual-unity of lived embodiment. The mirror represents the light of intellectual discernment and objective presence while the auditory metaphor represents the dynamic relations of sensory attunement that are largely absent from visual perception and conscious awareness. *Hume's concept of the socially constructed self never doubts the possibility of secure and reliable interpersonal communication.*

Also, recall that Descartes believes the foundation of personal identity as well as the principles of cognition, personal conduct, and self-esteem is a presocial, extra-experiential world of intellectual principles and objects. Insofar as we are able to operate according to such principles we learn to desire only what depends solely on ourselves and are consequently protected against the misfortunes and evils of interpersonal relations. Descartes (1649) explains that

> although the common people are very bad judges, yet because we cannot live without them and it is important for us to be an object of their esteem, we should often follow their opinions rather than our own regarding the outward appearance of our actions. (p. 401)

The aim is one of keeping up appearances only insofar as other persons are unavoidable, while believing that truths foreign to society at large and one's own body are of a superior order of things. Hume's account of the solitary thinker seriously undermines the credibility and authority of such illusory suppositions and is thereby able to show the primacy of ordinary experience and interpersonal relations. For Hume, we cannot form a concept or idea of ourself or our own personal identity, much less a justifiable self-opinion, without the reflected appraisals of other people. In fact, the opinions of others can help us from developing "an over-weaning conceit of our own merit" (p. 596). "A excessive pride or over-weaning conceit of ourselves is always esteem'd vicious and universally hated; as modesty, or a just sense of our weakness, is esteem'd virtuous, and procures the good will of every-one" (p. 592).

While Descartes acknowledges that ordinary language acquires the self-effacing transitivity through language learning or habit formation, he never transfers the principle to mathematical language. Hence, he also forgets that his primary vehicle of transcendence and knowledge of a supposedly solitary and immaterial self or ego is largely determined by socially determined and publicly observable standards. For Hume (1740), the Cartesian world of "extraordinary" transcendence is made possible by the ordinary world of experience and habit (p. 172). Purely cognitive therapy or introspective

self-interpretation easily forgets its roots in custom and experience. Once we have learned any kind of language, the "imagination" is "accustom'd to pass from the word to the idea" (p. 93). In other words, we attend to meanings of words rather than words themselves. Cognitive certainty is itself a social construction founded on the dual principles of "past" experience and "habit" that "determines me to expect the same for the future" (p. 265). Of necessity or cognitive certainty, Hume asserts that "there is but one kind of *necessity*, as there is but one kind of cause, and that the common distinction betwixt *moral* and *physical* necessity is without any foundation in nature" (p. 171). The social environment is especially important for the more abstract forms of transcendence.

According to Descartes (1641) "I am" or "I exist" for "as long as I am thinking" (p. 18), whereas Hume (1740) argues that "ourself, independent of the perception of every other object, is in reality nothing: For which reason we must turn our view to external objects" (p. 340). According to Hume's concept of the person, other selves are *the* most significant external objects. Not only do we need others to nourish the life of our passions, we are naturally disposed to be affected by the psychological states of other persons or selves while others are similarly affected by us. "Hatred, resentment, esteem, love, courage, mirth and melancholy; all these passions I feel more by communication than from my own natural temper and disposition" (p. 317). Also, "the passions are so contagious,that they pass with the greatest facility from one person to another, and produce correspondent movements in all human beasts" (p. 605). Sympathy is the most basic principle of interpersonal communication. Hume elaborates upon our native disposition or propensity to communicate our thoughts to one another. "No quality of human nature is more remarkable, both in itself and its consequence, than the propensity we have to sympathize with others, and to receive by communication their inclinations and sentiments, however different from, or even contrary to our own" (p. 316). This disposition and ability to communicate our thoughts and passions operates regardless of developmental level and intelligence. Sympathy reverses the order of cognition or the

combined operations of the imagination and understanding; instead of deriving ideas from preceding impressions, ideas or beliefs produce impressions of reflection or passions.

> When any affection is infus'ed by sympathy, it is at first known only by its effects, and by those external signs in the countenance and conversation, which convey an idea of it. This idea is presently converted into an impression, and aquires such a degree of force and vivacity, as to become the very passion itself, and to produce an equal emotion, as any original affection. (p. 317)

Elsewhere Hume explains that "the principle of sympathy or communication . . . is nothing but the conversion of an idea into impression by the force of the imagination" (p. 427). The primary operating principles are intersubjectively communicated or transpersonal passions and the imagination. Baillie (2000) explains Hume's concept of sympathy in terms of attunement.

> Sympathy consists in the empathetic capacity to *detect* the mental states of other persons, and as a result to undergo an experience similar to that of the person being considered. A useful analog is the way the sitar has "sympathetic strings" which are not touched, but resonate in response to primary strings. So we can say that sympathy allows us to "tune into" another's inner state. (p. 56)

With "regard to the passions" the "human mind" "resembles a string instrument" (Hume, 1740, p. 441). Notice, again, the dynamic auditory or sound metaphor that entails an elimination of interpersonal distance or the introduction of a strong sense of contiguity. Jonas (1966) argues that since "hearing" is bound to succession" and therefore does not present one with a "simultaneously coordinated manifold of objects," and since sound, a "dynamic fact," "intrudes upon a passive subject" according to its "intensity," the "freedom of selective attention is extremely limited" (p. 139). Interpersonal communication, at the level of sympathy, is involuntary and unavoidable.

A natural ability to be affected by the psychological states of others is essential to being human because

> man is altogether insufficient to support himself, and that when you loosen all holds, which he has of external objects, he immediately drops down into the deepest melancholy and despair. From this . . . proceeds that *continual search* after amusement in gaming, in hunting, in business; by which we endeavour to *forget ourselves*, and excite our spirits from the languid state, into which they fall when not sustain'd by some brisk and lively emotion. (Hume, 1740, p. 352, italics added)

The goal of exploratory movement or the "continual search" is to "forget" or transcend oneself in the midst of the *continuous* pursuit of interpersonal relations and interpersonally approved activities. The primary purpose of cognitive activity is not ultimately incoherent introspection into one's own cognitive processes but the pursuit of significance that lies beyond the self. Hume (1740) says

> that I own the mind to be insufficient, of itself, to its own entertainment, and that it naturally *seeks* after *foreign objects*, which may produce a lively sensation, and agitate the spirits. On the appearance of such an object it awakes, as it were, from a dream. . . . And the *whole* man aquires a vigour, which he cannot command in his solitary and calm moments. (p. 353, italics added)

A "rational and thinking Being like ourselves, who communicates to us all the actions of his mind" is "the liveliest of all objects" (p. 353). *Mutual recognition among thinking and feeling beings is what makes life worth living.* Hume characterizes the "*self*" as a "mind and body" (p. 303). The investigation into the cognitive operations of the solitary, immobile, and passively receptive observer entails ambiguous conclusions about the mind's own epistemological constancy and a corresponding vacillation of the passions; however, insofar as cognition is integrated with the "continual search," exploratory mobility, or the activity of a goal-directed, living organism or body, the operations of the mind (or integrated operations of the imagination, understanding, senses, and memory) become integrated with the operations of a physically grounded and socially stabilized incarnate self or "whole man" (p. 353).

Recall that Descartes (1649) teaches us that those who practice virtue "have very little esteem for everything that depends on others" (p. 385). This is a largely defensive

strategy that protects us from people who take things from others and other unfortunate circumstances. Hence we are supposedly not so vulnerable to the loss of external goods and subsequent disappointments. For Hume, however, external goods can be a stable or constant basis of pride or a good self opinion. The presupposition of a stable, just, and lawful social order in which we depend on others for our self-sufficiency must be taken for granted. Hume (1740) argues that "a man may be proud of his beauty, strength, agility, good mein, address in dancing, riding, fencing, and of his dexterity in any manual business or manufacture" (p. 279). Notice the strong element of physical appearance and physical ability. The exercise of one's "strength," "agility," "address in dancing," and "dexterity" integrate cognition with cause and effect. Now cognition engages causal power in terms of embodied effort, that is, ecstatic engagement with a world of physical forces. Causality is engaged on its own terms. Cognition is grounded *literally*. Each activity is socially constructed and approved. The beautiful and capable body, in Hume's thought, is a source of pleasure for its owner and for others. Descartes, especially in his *Meditations*, emphasizes the body as a source of pain and vulnerability that impedes transcendence. Hume, however, emphasizes the body as a source of pleasure and thus of transcendence and power. Leder (1990), for instance, describes a rather lively game of tennis that is disrupted by an episode of extreme heart pain.

> As the world of the game is disrupted, so is the connection with the other. A moment before the two players were bound together. They shared the court, the flight of the ball, the wind, the joy of effort and competition. Their thoughts intertwined around the goal of victory, the mutual anticipation of each other's strategy. But pain strikes one alone. Unlike the feel of the cool wind, pain is marked by an inferiority that another cannot share. . . . Such is not the case with pleasure. While sensations of pleasure and well-being may call one back to one's body, there is rarely the same character of disrupted intentiality vis-a-vis objects or other people. Pleasures are usually secured through the body's commerce with the world effecting a satisfaction of need or desire. (p. 74)

Insofar as we conceptualize the body in terms of pleasure, in principle, it is as much a vehicle of transcendence as are the activities of disciplined, reflective cognition.

For Hume the passions of pride and humility and corresponding concepts of the self are produced by the approval and disapproval of other persons. That is to say, others either confirm or disconfirm and simultaneously help to produce a value-based concept of oneself and therefore of one's sense of self-worth or self-esteem, too. While, on the one hand, one's sense of self-worth depends *directly* upon one's ability to execute some valued performance or one's ownership of some valued object or property, on the other hand, self-worth is grounded *indirectly* through others who are needed for the recognition and evaluation of one's abilities and possessions. Since pride and humility are not produced directly by one's own pleasant or painful impressions, but are mediated through the hedonically qualified impressions of the evaluative attitudes of others, they are defined by Hume as indirect passions. Hume (1740) says that "our reputation, our character, our name are considerations of vast weight and importance; and even other causes of pride; virtue, beauty and riches; have little influence when not seconded by the opinions and sentiments of others" (p. 316). He explains that "by *pride* I understand that agreeable impression, which arises in the mind, when the view of either our virtue, beauty, riches or power makes us satisfy'd with ourselves: and by *humility* I mean the opposite impression" (p. 297). Being affected agreeably or pleasurably by approval and disagreeably, uneasily, unpleasurably, or even painfully by disapproval are native dispositions of the self. Hume explains that

> nature has given to the organs of the human mind, a certain disposition, fitted to produce a peculiar impression or emotion, which we call *pride*: to this emotion she has assign'd a certain idea, *viz.* that of the *self*, which it never fails to produce. (p. 287)

Others are therefore indirect causes of one's sense of self-esteem. We are "peculiarly pleas'd with any thing, that confirms the good opinion we have of ourselves, and are easily shock'd with whatever opposes" (p. 32).

While Hume emphasizes pride's power to produce an idea of a valuable self, he says much less about the kind of self that is produced by humility. Since humility

produces a low self-opinion, the corresponding self-concept must be diminished to the extent that an episode of humility endures. Hume (1740) describes the production pride and humility and corresponding self-concepts or ideas of self in terms of the "double relation of impressions and ideas" (p. 308). The following passage presupposes a first (0) impression that precedes and produces the first (1) idea.

> In a word, nature has bestow'd a kind of attraction or certain impressions and ideas, by which one of them, upon its appearance, naturally introduces its correlative. If these two attractions or associations of impressions and ideas concur on the same object, they mutually assist each other and the transition of the affections and imagination, is made with the greatest ease and facility. When an [1] idea produces an [2] impression, related to an [3] impression, which is connected to an [4] idea, related to the first [1] idea, these two impressions [2&3] must in a manner be inseparable, nor will the one in any case be unattended by the other. 'Tis after this manner, that the particular causes of pride and humility are determin'd. (p. 289)

The first (1) idea is a conceptualization of the other person's approval or disapproval; for example, particular gestures, facial expressions, or explicitly stated evaluative comments directly express evaluative attitudes. The first (2) impression from the passage is produced or caused by the first (1) idea and is a felt impression of or affective response to another's pleasure or pain in contemplating *a* possession or performance. This impression of reflection is the felt objective component of the double relation since it could operate without any known relation or connection to an owner of the object or performance. For instance, one could take pleasure in contemplating a fine house without recognizing its owner or builder, or take pleasure in a fine performance without recognizing in it any qualities that specify the identity of the performer. Perhaps we might listen to a fine presentation on Hume's epistemology in which the content is merely a restatement of someone else's research. Our approval might thus be entirely justified, but, in truth, its laudable content is not causally related to the speaker. Insofar as the object of approval or disapproval is not related or not known to be related to a particular agent or owner, neither approval nor disapproval produce pride or humility.

Thus far we have examined only the first half of the double relation of ideas and impressions. Agreeable or disagreeable objects that are not connected to a cause or owner are therefore restricted to the production of "joy" or sadness (p. 290). Joy "has only one object necessary to its production, *viz.* that which gives pleasure" whereas "pride has in a manner two objects, to which it directs our view" (p. 292). "We may feel joy upon being present at a feast, where our senses are regal'd with delicacies of every kind: But 'tis only the master of the feast, who, besides the same joy, has the additional passion of self-applause and vanity" (p. 290). The idea or concept of the object of joy or sadness produces a pleasant or an unpleasant impression of reflection so that the idea and impression combine to form the passion of joy or sadness. A passion thus has both a cognitive or conceptual component and a felt or affective component that is non-propositional or not analyzable in terms of reflective thought. Hume says "that 'tis not the present sensation alone or momentary pain or pleasure, which determines the character of any passion, but the whole bent or tendency of it from the beginning to the end" (p. 381). The contrast might also be understood in terms of a self-effacing directed, impulse and a felt dynamic or causal aspect.

The second (3) impression from the above passage about the double relation is a distinct and separate felt impression of another's pleasure or pain in contemplating a possession or performance that is related to someone by agency or ownership. Let us say it is largely or entirely mine. This impression cannot exist or operate in the absence of my agency or ownership. Because the first and second impressions are distinct but inseparably connected to one another, the objective and subjective components or references are integrated or unified. The second (4) idea is the belief or vivid conceptualization that the valued object or performance is related to me by way of my causal power or in terms of my legal ownership. The first (1) and second (2) impressions are associated with one another because of a *hedonic* resemblance, while the first (1) and second (2) ideas are associated because of resemblance or identity of *direction of*

impulse. The first idea is of the other's approval of *my* performance or object, while the second is another's approval of *my* self as the cause or agent. The second idea grounds the first felt (1) impression of approval in the second (2) impression of approval of my self. The other's recognition or approval is felt as their love for me or their positive valuation of me whereby I feel the passion of pride or a high self-opinion. Another's recognition of my disagreeable or unpleasant possession or performance and consequent disapproval is felt by me as hatred for myself and a low opinion of myself. The transition of thought from the first impression to the second is facilitated by the hedonic resemblance between the two while the transition of awareness from the first idea to the second idea is facilitated by resemblance or identity direction of impulse. The object of both is *my*self. The passion of pride is produced by a pleasant object related to myself, while pride causes an idea of self as an object of value. Hume states a general principle "*that all agreeable objects, related to ourselves, by an association of ideas and impressions, produce pride, and disagreeable ones humility*" (p. 290).

Hume describes some additional limitations on pleasant or painful objects that can produce pride or humility. The "agreeable or disagreeable object," Hume (1740) explains, must be "not only closely related but also peculiar to ourselves, or at least common to us with few persons" (p. 291). And "'tis remarkable, that goods, which are common to all mankind, and have become familiar to us by custom, give us little satisfaction" (p. 291). Health, for instance, is seldom an object of pride, unless, perhaps, we are responsible for surviving some difficult or unusual health hazard. Those objects that exemplify some kind of "singularity" are given a "much higher value" (p. 292). In other words, rare, unique, or one-of-a-kind objects are valued more than those that are indistinct from many others. Goods that are "common to all mankind, and have become familiar to us by custom, give us little satisfaction" (p. 291). Because we are disposed to "judge of objects more from comparison than from their real or intrinsic merit," we are "apt to overlook even what is essentially good in them" whenever "we cannot by some contrast enhance

their value" (p. 291). Although uniqueness alone does not determine the value of an object, it is a feature that enables us to distinguish the first and second impressions of the double relation of impressions and ideas. A performance or possession that is unlike any other of its kind specifies its owner exclusively. Although the uniqueness of oneself and one's productions is a defining feature of individual autonomy, Hume does not develop the concept. Hume also tells us that "the pleasant or painful object" must "be very discernible, and obvious, and that not only to ourselves, but to others also" (p. 292). An object of the passion must have an enduring relation to the self. "What is causal and inconstant gives but little joy, and less pride" (p. 293). "But as custom and practice have brought to light all these principles, and have settled the just value of everything; this must contribute to the easy production of the passions" (p. 294). Custom sets the standard for the utility and agreeability of unique objects. Being one-of-a-kind presupposes some customary standard for the value of different kinds of objects.

Let us briefly examine the psychological principles whereby pleasure or pain, by natural necessity, spontaneously introduce pride or humility. While "ideas are associated by resemblance, contiguity, and causation," impressions of reflection are associated "only by resemblance" (p. 283). Impressions of reflection are associated spontaneously, involuntarily, and independent of experience.

> All resembling perceptions are connected together, and no sooner one arises than the rest immediately follow. Grief and disappointment give rise to anger, anger to envy, envy to malice, and malice to grief again, till the whole circle be completed. . . . 'Tis difficult for the mind, when actuated by any passion, to confine itself to that passion alone, without any change or variation. Human nature is to inconstant to admit of any such regularity. Changeableness is essential to it. (p. 283)

Of course, change is regulated by the principle of association by hedonic resemblance. The change from an agreeable impression to an impression of pride is the spontaneous or automatic transition facilitated by the mind's own native restlessness. Impressions of

reflection also afford the self a kind of continuity in the midst of constant variability. Hume says,

> Ideas never admit of a total union, but are endow'd with a kind of impenetrability, by which they exclude each other, and are capable of forming a compound by their conjunction, not by their mixture. On the other hand, impressions and passions are susceptible of an entire union; and like colours, may be blended so perfectly together, that each of them may lose itself, and contribute only to vary that uniform impression, which arises from the whole. (p. 366)

For example,

> Love and hatred are not completed within themselves, nor rest in that emotion, which they produce, but carry the mind to something farther. Love is always follow'd by a desire of the happiness of the person belov'd, and aversion to his misery: As hatred produces a desire of the misery and an aversion to the happiness of the person hated. (p. 367)

Pride and humility, however, are "unattended with any desire" and do not "immediately" excite "us to action" (p. 367).

According to Hume, there are three distinct kinds of passions. There is one kind of indirect passion and two kinds of direct passion. Direct passions originate either from internal or external objects of motivation, while indirect passions originate only from external objects of motivation. Love, hate, pride, and humility are indirect also because they are mediated by another thinking being or person. Direct passions arise immediately and exclusively from one's own impressions of pain or pleasure. Such impressions may be produced by external objects or by internal objects such as appetites, instincts, desires, or, perhaps, drives. Hume (1740) says,

> An impression first strikes upon the senses, and makes us perceive heat or cold, thirst or hunger, pleasure or pain of some kind or another. Of this impression there is a copy taken by the mind, which remains after the impression ceases; and this we call an idea. This idea of pleasure or pain, when it returns upon the soul, produces a new impression of desire and aversion, hope and fear, which may properly be called impressions of reflexion because derived from it. (p. 8)

We may observe, Hume says, that direct and indirect passions

> are founded on pain and pleasure, and that in order to produce an affection of any kind, 'tis only requisite to present some good or evil. Upon removal of pain and pleasure there immediately follows a removal of love and hatred, pride and humility, desire and aversion. (p. 438)

The goals pursued by the self are not always the short-term effects of momentary external or environmental stimulation; cognitive processes play an active role in the organization of action over the long term. The mind forms value-oriented concepts of what may be expected, that is of what may lie far beyond the present moment based on past experience. Desire is thus conditioned by reality. "The mind by an *original* instinct tends to unite itself with the good, and to avoid the evil, tho' they be conceiv'd merely in idea, and be consider'd as to exist in any future period of time" (p. 438). The basic contrast, in psychoanalytic terms, is between the operations of a pleasure principle whereby only present moment is of significance and a kind of native or original reality principle whereby the longer term goals are conceived and pursued. Of course, learning must play a significant role in the development of natural tendencies that can vary in quality. Hume also argues that our activity is also regulated by a kind of social drive or instinct, an innate, and perhaps flexible, interpersonally oriented organization of desire, passion, and corresponding patterns of interpersonal relations. Of those impressions caused by internal objects or impulses, Hume says:

> Besides good and evil, or in other words, pain and pleasure, the direct passions frequently arise from a natural impulse or instinct, which is perfectly unaccountable. Of this kind is the desire of punishment to our enemies, and of happiness to our friends; hunger, lust, and a few other bodily appetites. These passions, properly speaking produce good and evil, and proceed not from them, like other affections. (p. 439)

The individual person is not restricted to passive receptivity but is also an active causal power in the making of his or her own world.

Recall that Descartes (1649) distinguishes between the operation of passions that the soul or intellect passively suffers or undergoes and the internal emotions that are actions of the soul. Passions, according to Descartes, are caused by the body and produce

an activity-disrupting mode of bodily presence. A passion is always caused by "some movement of the spirits" (p. 381). The passions, to some extent, produce bodily dys-appearance and therefore can oppose the judgements of reason. The "internal emotions which are produced only by the soul itself," however, are supposed to be immaterial and thus are able to operate independent of the "movement of the spirits" (p. 381). Descartes' internal emotions are produced by judgements of what is true and false. Since desire is a combination of passion or emotion and volition, action in principle can be produced or caused by reason alone. But for Hume, reason by itself has no such causal power. Hume (1740) says that "reason is, and ought only to be the slave of the passions, and can never pretend to any other office than to serve and obey them" (p. 415). Perhaps the idea of a hierarchy is a bit of an overstatement, since each principle performs its own unique function in a functionally integrated whole. Reason is motivationally inert or neutral.

> 'Tis obvious, that when we have the prospect of pain or pleasure from any object, we feel a consequent emotion of aversion or propensity, and are carry'd to avoid or embrace what will give us this uneasiness or satisfaction. 'Tis also obvious, that this emotion rests not here, but making us cast our view on every side, comprehends whatever objects are connected with its original one by the relation of cause and effect. Here then reasoning takes place to discover this relation; and according as our reasoning varies, our actions receive a subsequent variation. But 'tis evident in this case, that the impulse arises not from reason, but is only directed by it. (p. 414)

In other words, goals are set by desire or emotional-intent while reason determines the means. Otherwise, Hume argues, volition and demonstrative reason seem to be "totally remov'd, from each other" (p. 413). Demonstrative or intellectual reason does not of itself produce "any influence" (p. 413). The "combat of passion and reason" and the so-called "preference to reason" over the influence of the passions is based on a misunderstanding of the operations of the whole person or self. "Nothing can oppose or retard the impulse of a passion but a contrary impulse"; reason itself has "no original influence" (p. 415).

Hume explains that the Cartesian concept of free-will or a will that operates independent of the causal or natural order is based on an illusion produced by the imagination. An act of will, for Hume, is determined by the integrated influences of belief, imagination, passion, reason, memory, embodiment, and circumstances. Hence, an act of will is not an ideally autonomous mental event. Descartes (1641) says that free-will "consists simply in the fact that when the intellect puts something forward for affirmation or denial or for pursuit or avoidance our inclinations are such that we do not feel we are determined by external force" (p. 40). In other words, an act of will is not accompanied by any awareness or sensibility of physical effort that originates from within the body or physical resistance that originates from beyond the body. During an act of will the body is not thematically present to awareness. The influence of other persons is also not felt or recognized. In terms of Leder's (1990) concept of the structure of lived-embodiment, an act of will exhibits a level of focal disappearance so great that its embodied roots are almost--if not entirely--concealed. Hume (1740) says, "We feel that our actions are subject to our will on most occasions, and imagine we feel the will itself is subject to nothing" (p. 408). Consequently, if we are so inclined, we infer that an act of will is exempt from the causal or natural order and therefore the operation of the passions as well. An act of will is thereby conceptualized as a purely intellectual operation. Hume says that "reason . . . exerts itself without producing any sensible emotion; and . . . scarce ever conveys any pleasure or uneasiness. Hence it proceeds, that every action of the mind, which operates with the same calmness and tranquility, is confounded with reason" (p. 417). *Affective states can exhibit a level of focal disappearance comparable to that of reason.*

Now for Hume, the term "emotion" is generally used for affective states accompanied by a "sensible agitation"; this implies physiological activity conceptualized in terms of the "spirits," "the hurry of the spirits," or "the spirits in agitation" (p. 423). The body emerges as a thematic and, perhaps, problematic object of awareness. Hume

generally reserves the term "passion" for self-effacing affective states that, insofar as they are self-effacing, can be mistaken for the operation of reason. (Hume has thus reversed Descartes' use of the terms "passion" and "emotion" but not the meaning of the concepts.) As one forms habits or dispositions of acting and being affected according to one's own temperament, ability, and situation, emotions are gradually transformed into fully formed psychological states or passions. In phenomenological terms there is a shift from bodily dys-appearance and immanence to disappearance and transcendence or, in Hume's terms, from "violent" to "calm" affective states.

> 'Tis evident passions influence not the will not in proportion to the violence, or the disorder they occasion in the temper; on the contrary, that when a passion has become a settled principle of action, and is the predominant inclination of the soul, it commonly produces no longer any sensible agitation. (p. 419)

Our most basic passions or motivating impulses are frequently absent from awareness yet can still operate on a continuous and reliable basis.

> Now 'tis certain, there are certain calm desires and tendencies, which, tho' they be real passions, produce little emotion in the mind, and are more known by their effects than by immediate feeling and sensation. These desires are of two kinds; either certain instincts originally implanted in our natures, such as benevolence and resentment, the love of life, and kindness to children; or the general appetite to good and aversion to evil. When any of these passions are calm, and cause no disorder in the soul, they are very readily taken for the determinations of reason. (p. 417)

The intellect, understanding, or reason is concerned with matters of fact or truth and falsehood or presently existing states of affairs, whereas desires or instincts are concerned with states of affairs that may be produced through action, of what does not presently exist as desired but may be brought about through action. Jonas (1966) explains,

> Locomotion is toward or away from an object, i.e., pursuit of flight. A protracted pursuit, in which the animal matches its powers of movement against those of the intended prey, bespeaks not only of developed motor and sensor faculties but also *distinct powers of emotion.* It is safe to assume that *the number of intermediate steps over which the purpose can extend itself is a measure of the stage of emotional development.* The very

> span between start and attainment which such a series represents must be bridged by *continuous emotional intent*. (p. 101, italics added)

The continuity of an identical self over the long-term must be conceived in terms of continuously operating passions and the corresponding pursuits of a whole person. Passions that operate in a typically calm manner are seldom noticed because attention is directed outward to objects that lie beyond the "here" and "now" of immediate sensory experience. Taken-for-granted dispositions to be affected by and act toward others such as "benevolence and resentment" or the desire for the well-being of one's friends and the ill-being of one's enemies, "kindness to children," and "the love of life" typically operate in a calm or self-effacing manner and are not only distinct from but are opaque to the light of reflective thought or reason. These enduring, life-long social drives arise not from preceding perceptions of pleasure or pain but from "a natural impulse or instinct, which is perfectly unaccountable" (p. 439). Hume says that "what we call strength of mind, implies the prevalence of calm passions above the violent" (p. 418).

Although sympathy is a natural and powerful principle of communication, by itself it provides no sense of moral direction or constancy for the individual. Recall that for Descartes moral inconstancy and emotional instability can be attributed to our unavoidably insecure or uncertain relation to external goods of all kinds. They can be taken away or withheld from us by others. Chance or misfortune might intervene. The key consequential problem for the individual personality is conceived in terms of waxing and waning self-esteem. The solution is a kind of withdrawal from the desire for and pursuit of external goods and other persons, that is to say, a conscious devaluing of both as causes of personal vulnerability. But for Hume, interpersonal agreement among participating members of society can protect us against losses and promote our well-being. Baillie (2000) explains that

> Recognition of society's long-term benefits can motivate us to change our external circumstances so that our self-interested passions will be redirected. While in nature, selfishness motivates us to take other's

> possessions, whereas conventions create circumstances under which it benefits us, in the long term, to curb these impulses. In saying that the understanding changes the direction of the passions, Hume means that no new motive is added; rather a new means-end solution is proposed, in the form of property conventions, to satisfy pre-existing needs for security, and so on. (p. 164)

Since Hume rejects idealized moral standards and character traits, but instead conceives of the redirection of existing forms of motivation, personal qualities, and abilities, he is a moral-realist. Hume (1740) says that "It may be established as an undoubted maxim, *that no action can be virtuous or morally good, unless there be in human nature some motive to produce it, distinct from the sense of morality*" (p. 479). Society and morality are artificial constructions that are based on preexisting, natural human wants and needs. The "remedy for the partiality of our affections" desire for gain, or greed is that moral concepts "conform themselves to that partiality, and give it additional force and influence" (p. 489). In other words, by participating in society according to its rules and conventions, the individual person can gain more external goods than by acting alone. Hume (1740) explains further:

> The remedy, then, is not deriv'd from nature, but from *artifice*; or more properly speaking, nature provides a remedy in the judgment and understanding, for what is irregular and incommodious in the affections. For when men, from their early education in society, have become sensible of the infinite advantages that result from it, and have besides aquired a new affection to company and conversation; and when they have observ'd, that the principal disturbance in society arises from these goods, which we call external, and from their looseness and easy transition from one person to another; they must seek a remedy, but putting these goods, as far as possible, on the same footing with the fix'd and constant advantages of the mind and body. . . . By this means, every one knows what he may safely possess; and the passions are restrain'd in their partial and contradictory notions. (p. 489)

Such "restraint" is not contrary to these passions but "only contrary to their heedless and impetuous movement" (p. 489). Hume asserts that "the sense of justice and injustice is not deriv'd from nature, but arises artificially, tho' necessarily from education and human conventions" (p. 483). The sense of justice and injustice is an artificial virtue that

facilitates our recognition of conventions that stabilize the possession of external goods or property. This is the kind of stability that prevents interpersonal conflict and produces a unity of purposes among persons. Individual emotional stability and moral constancy are thereby produced or facilitated. The natural order is shaped by the artificial order. "Education is an artificial and not a natural cause" (p. 117). Education that facilitates socialization must begin early because once a character is fully but poorly formed it can rarely be changed.

Hume defines virtue and vice in exclusively social terms and restricts its evaluation to the third person perspective. Hume (1740) says that "Where a person is possessed of a character, that in its natural tendency is beneficial to society, we esteem him virtuous, and are delighted with the view of his character" (p. 584). This delight or pleasure, if it is to be a moral sentiment, must arise from a generalized and impartial perspective. Moral discernment or moral taste must be shaped by an informed belief concerning what is good for society as a whole. Chazan (1998) says that "When pride receives affirmation from moral sentiment, we have corrected pride" (p. 27). Naturally produced approval and disapproval are artificially redirected to personal qualities that benefit society. Natural impulses are thereby given a social direction. The reflected appraisal of others, in contrast to oneself, is essential. Hume (1740) says that "Nothing is more disagreeable than a man's over-weaning conceit of himself. . . . No one can well distinguish in himself betwixt the vice and virtue, or be certain, that his esteem of his own merit is well-founded" (p. 598). Other people who are competent moral judges are required.

> The approbation of moral qualities most certainly are not deriv'd from reason, or any comparison of ideas; but proceeds entirely from moral taste, and from certain sentiments of pleasure and disgust, which arise upon the contemplation and view of particular qualities or characters. (p. 581)

Approbation and disapprobation are distinctively moral sentiments. "The experience of virtue produces a distinctive, calm pleasure (*approbation*); experience of vice produces a

distinctive calm pain (*disapprobation*)" (Norton & Norton, 2000, p. 538). The calmness or self-effacing transitivity of both emphasizes the absence of one's own presence in the field of perception or a lack of reference to one's own possibly selfish self-interest. The aim is impartial judgment. *Because a thinking and moral being is essential in matters of taste, morality is not reducible to an explicit set of rules and formulas.*

For Hume the character flaws or vices of a fully developed individual cannot be corrected by any kind of therapy, reform education, or teaching method. Once a character or character trait is established by habit, it operates with the same kind of necessity as that of the natural order. Descartes' cognitive therapy is therefore a weak and ineffective solution. Hume (1740) argues that

> I may have recourse to study and reflexion within myself; to the advice of friends; to frequent meditation, and repeated resolution: And having experienc'd how ineffectual all these are, I may embrace with pleasure any other expedient, by which I may impose a restrain upon myself, and guard against this weakness. (p. 537)

Because of their "natural weakness," innately weak reality-principle, or native incapacity for self-control, humans must as a group establish a social environment that is more coercive and conducive to intelligent regulation of behavior. Hume argues that

> Men are not able radically to cure either, in themselves or others, the narrowness of soul, which makes them prefer the present to the remote. They cannot change their natures. All they can do is change their situation, and render the observance of justice the immediate interest of some particular persons, and its violation their more remote. (p. 537)

In other words, instead of changing or reforming individual characters, one must change or reconstruct the social environment.

The Humean concept of the self or whole person implies some important things for education. *The most basic principles of learning are experience and habit or custom.* Humean education would aim to produce disciplined thinkers who are above all else lovers of interpersonal security and morality. Generally, the emphasis is on sociability instead of autonomy. Hume's concept of the individual person is similar to Bennett's

(1999) concept of the "*Field-dependent Learner*" (p. 182). According to Bennett, such learners are "highly sensitive and attuned to" the "social environment" and exhibit "highly developed social skills" (p. 182). Sensitivity and attunement to the social environment implies the operation of sympathy or the principle of interpersonal communication. Highly developed social skills are also prescribed by Hume. Bennett's field-dependent learners are also "extrinsically motivated" and "responsive to social reinforcement" (p. 182). Hume (1740) says that

> We can form no wish, which has not a reference to society. A perfect solitude is, perhaps, the greatest punishment we can suffer. Every pleasure languishes when enjoy'd a-part from company, and every pain becomes more cruel and intolerable. . . . Let all the powers and elements of nature conspire to serve and obey one man: Let the sun rise and set at his command: The sea and rivers roll as he pleases, and the earth furnish spontaneously whatever may be useful or agreeable to him: He will still be miserable, till you give him some one person at least, with whom he may share his happiness, and whose esteem and friendship he may enjoy. (p. 363)

Fellowship and the approval of others are among our most basic needs. Field-dependent learners also favor a "spectator-approach" to learning. This tendency is reflected in Hume's account of the solitary abstract thinker who passively observes the operations of the world.

Since Hume (1740) says that "a man may be proud of his beauty, strength, agility, good mein, address in dancing, riding fencing, and his dexterity in any manual business or manufacture" (p. 279), education should not be of the monastic variety suggested by Descartes. Individuals should not be restricted to the study or classroom. Physical education, sports, social skills, and, perhaps, even shop class or trade education are on equal footing with intellectual learning. Although the pursuit of solitary abstract thinking might be encouraged, the primary purpose of education would be the development of the mind and body together. In other words education would aim to develop the whole

person embedded in an interpersonal context that operates according to historically determined moral standards.

Now the main problem that Hume leaves us with is that self-interpretation or cognitive therapy and the corresponding ideas of personal autonomy are meaningless. While the principles of experience and habit provide a secure foundation for society as a whole, they rule out the possibility of correcting individual character flaws. One important implication is that once a character is fully formed and developed, there is nothing left for education to do. The purpose Chapter 5 will be to see what can be done for autonomy and self-interpretation. Chapter 4 will reconceptualize perceptual theory in terms of exploratory movement and goal-directed activity.

CHAPTER 4
GIBSON AND TURVEY ON AUTONOMY AND NATURAL LAW: THE ACTION AND PERCEPTION SYSTEM OR COGNITIVE SYSTEM

The therapeutic goal of the ecological concept of mind is to restore psychological theory, philosophy of mind, and those who use such material to the world of qualitative experience. The general aim is to reconceptualize perception and action in ecological terms whereby the mind is conceived as a whole person whose goal-directed action is controlled by functionally and environmentally specific information. Qualitative experience is not reduced to what is present to conscious awareness but is conceptualized in holistic terms of environmental layouts. In response to Hume's negative evaluation of cognitive theory, this chapter frames cognition according to the dynamics of action and of the operation of emotional-intent. Cognition is thus conceived in a manner that complements a wide range of experience.

The general problem for perception and action concepts is that of constancy or invariance of form in spite of unlimited variability of form. We can identify the same object and the same kind of object in spite of unlimited variation of objective form and surrounding conditions. Also, we can repeatedly perform the same goal-directed act in spite of an unlimited quantity of variations in the form of movement and current conditions.

Traditionally, the unlimited variability implicit in the conditions of qualitative experience is conceptualized in terms of a directly perceived and discontinuous succession of massively equivocal or ambiguous appearances that serve more to disguise or conceal than to disclose sources of constancy. Since current experience and the objects of current experience are defined in terms of unlimited ambiguity and incoherence, experience and its objects must be given invariant structure either by innate ideas or ideas

retrieved from memory of prior experience. Either way, perception of invariance is largely--if not entirely--conceptual. Perception and construction of constancy are therefore a matter of already knowing precisely what something is and precisely what pattern of movement to execute. In order to be able to construct the same action as performed earlier and identify the same object as one seen earlier, the mind must be able to represent every possible pattern of movement and every possible state of the world. Since representations are the only object of awareness, perception of invariant form or veridical perception is indirect or mediated by psychological processes.

The description of the operation of the action system will show how action is controlled by perception, while the concept of the perceptual system will show how action makes perception possible. The operations of the two systems form a functional dual-unity. The following summary reflects the general organization of the discussion of perceptual theory. Perceptual theory is presented first and action theory is presented afterwards. Each component constitutes nearly half of the chapter. Criticisms of traditional approaches emerge from the discussion as they are implied by the main discussion. First is a reconceptualization of perceptual stimulation. Information is specific to the world, not to the senses. Second, I shall explain how the senses are used functionally and systematically. Third is an account of the relations among exploratory movements and perceptions of environmental layouts and events. Fourth is an explanation of the from-to structure of perception of the objects and world of qualitative experience. Fifth is the concept of affordances or meaningful invariant-structures. The basic argument is that objective perception is largely value oriented. Sixth, perception of the continuing or persisting existence of things is explained in terms of optical transitions. Seventh, the incoherence implied in basing perception of constant form on inconstant form is resolved with the concept of detecting optical invariants under transformation. Eighth is a description of the higher order invariants of growth transformations that make recognition of aging or growing organisms possible. Generally, the problems of

perception of the continuing existence of things or persons and perception of the identity of things or persons is coherently resolved in terms of invariant structures that are themselves formless, or in phenomenology terms invisible.

Next is the concept of the action system, which can be roughly divided into four parts. First is a discussion that leads to a concept of an action heterarchy or coalition. This discussion shows how agency and information are dynamically organized in the central nervous system. Second is a corresponding conceptualization of dynamic spinal processes. Third is an account of how action is controlled by perceptual information. Fourth is what the conclusions of ecological theory imply for learning and education. A more detailed outline is reflected by the following. First is a contrast between a mechanical motor system and an ecological action system. Second, the discussion shifts to coordination and the operation of functional groups of muscles. Third is an evaluation of the traditional distrust of experience and the idea that actions are psychologically constructed. Fourth, the exclusively top-down or center-outward model of executive knowledge and control is proposed. Sixth, the intelligent and active role of the spinal cord in control of action is explained in terms of the tuning of action structures. Seventh is an account of how a muscle-joint system behaves like a mass-spring system. Eighth, the concept of tuning reflexes is developed. Ninth is a description of how information and control are progressively distributed throughout the system during the evolution of an action. Tenth, the static and dynamic components of posture and movement are explained. Eleventh, the concept of tuning is elaborated further. Twelfth, the roles of higher and lower order forms of information in the direction and control of action is explained. And last, the ecological concept of mind implies that education should renew its emphasis on the role of qualitative experience in learning of all kinds.

The ecological concept of mind is the mind conceived as an action-and-perception system. *The central thesis for this chapter is that perception and cognition neither are mediated by cognitive construction processes that isolate an inner self from the external*

world (or other minds) nor are rigidly determined by the operations of the external world (or other minds), but instead are dynamic, temporally conditioned processes that can be directly connected or attuned to the physical and social world by means of exploratory and goal-directed action. Consequently, the assumption (basic for this study) that we are disposed to be either autonomous or sociable cannot be grounded in the native cognitive structure of our minds. That is to say, there is no sound epistemological justification for the dichotomy.

For the ecological concept of mind, neither pure conceptual thought nor associations among impressions are necessary for unambiguous, objective perception of the objects and world of qualitative experience. That is to say, transcending consciousness of immediate sensory qualities and univocally perceiving the invariant meaning-structures of the world beyond the self does not depend on intellectual construction processes. Traditional or standard approaches to psychological theory assume that perception is based on consciousness of sensory qualities. The data of sense are innate or given and not modifiable by learning. What appears through five fixed-capacity, passively-receptive, and functionally-isolated channels of sensation are five different kinds of uncertain, vague, obscure, ambiguous, or unstructured information. Sensory information that specifies external objects is of the same kind or quality as those that specify various internal physiological symptoms such as aches and pains. Both are subjective objects of present-moment sensory arousal. For example, if I have a bad tooth, I may feel a pain in another healthy tooth. My dentist calls it referred pain when pain is present in a healthy tooth and absent from the unhealthy tooth. Dentists have concepts and procedures for sorting out very ambiguous or obscure symptoms until the source of the trouble is unambiguously or clearly and distinctly determined. Like a medical doctor who knows that a pain in the jaw or shoulder may be a symptom of heart trouble, a dentist must interpret ambiguous or equivocal symptoms in order to perform an objective evaluation of a patient's condition. Traditional concepts of mind assume that essentially

the same kind of interpretation must be applied to the objects of ordinary experience, only in an ongoing or continuous and unconscious manner.

According to traditional assumptions, perception of an object of qualitative or ordinary experience is objective only insofar as it is the outcome of psychological construction processes. Visual sensations, for instance, are ambiguous with respect to what is near or far and square or trapezoidal. Concepts of resembling past experiences are retrieved from memory in order to construct an objective representation of the objects of present-moment experience or sensory arousal. The information from one channel of sensation (i.e., vision) may be given meaningful structure only by being associated with a different kind of information from another channel of sensation (i.e., touch). Action is also based on the formation of associations. In order to know how to act, an image or representation from memory must be retrieved and compared with the object of present-moment experience before one knows whether, say, pursuit or flight is the best course of action. One of the biggest single problems of all forms of associationism is the storage retrieval or image comparison paradox. In order to find the proper matching image for the present-moment representation, the mind must be able to search through a potential universe of stored images, or it must already know what it is looking for, in which case it need not look. Shaw and Pittenger (1978) explain that

> the image comparison model not only fails because it ensnares the theorist in a vicious circle, but it also fails because no comparison tests--even in principle--are capable of proving that a given object is or is not a variant form of an object experienced earlier. (p. 195)

The image comparison model is unable to distinguish a numerically identical object in motion undergoing transformations of optical form from a succession of numerically distinct, motionless, and similar objects. Even so, orthodox assumptions remain influential. In considering the problem of perception, the first question that traditional or reductive psychological theory asks is how the uncertain or ambiguous objects of ordinary experience are given objective structure. The answer is always based on some

kind of internal psychological construction processes that produce objective representations. The purely hypothetical nature of such processes becomes evident as we notice that qualitative or ordinary experience is not an ongoing struggle with ambiguity and unstructured confusion.

Gibson (1966) says that "in considering the problem of perception the first question to ask should be, what is there to be perceived? . . . The environment is the source of all stimulation" (p. 7). According to the ecological approach, objective meaning-structures are a *directly* detected feature of the external world or environment, so nothing needs to be represented in the mind. The lawlike structures of the external world are in-the-world and not in-the-head at all. For Gibson we must first clearly conceptualize an environment that is adequately structured for objective perception. We must be able to presuppose a source of perceptual information that does not need to be corrected or enriched by corrective cognitive processes. Otherwise there is no objective way to constrain hypothesis formation about psychological processes. We must first understand *what* there is to be perceived before we can understand *how* perception is achieved. That we frequently perceive or find only what we are looking or searching for should not lead us to infer that perception is a largely--if not entirely--confined to subjective reality. Since opportunities are unlimited, perception must be highly selective. Gibson explains,

> The environment consists of opportunities for perception, of available information, of potential stimuli. Not all information is registered, not all stimuli excite receptors. But what the environment affords an individual in the way of discrimination is enormous, and should be the first consideration. (p. 23)

Since the environment provides an inexhaustible wealth of perceptual possibilities that exceeds our capacity for active exploration and discrimination, and since we would never perceive many things had we not first searched for them, perception cannot be reduced to imposed stimulation. Explaining further, Gibson (1979) says, "The information in

ambient light, along with sound, odor, touches, and natural chemicals is inexhaustible. A perceiver can keep on noticing facts about the world she lives in to the end of her life without ever reaching a limit" (p. 243). A reductive theory of perception, however, assumes that perceptual information is always imposed upon a passively receptive observer or perceiver.

Traditional approaches also assume that perceptual information is energy specific so that the presence of a sufficient quantity of a specific kind of energy (that is specific to a particular kind of receptor or channel of sensation) imposes ambiguously structured or unstructured perceptual information upon the mind or intellect. The mind, upon receiving specific quantities and qualities of energy, measures those quantities; and from those measurements and the association of different qualities or kinds of information, the mind constructs a veridically structured representation of external objects. Perception, in the concrete sense of the word, is thus conceived to be a largely--if not entirely--involuntary imposition of specific kinds and quantities of ambiguously structured or unstructured energy upon the mind. That is to say, there is no intelligence or agency at the level of the body. Only the inner mind performs an active and voluntary role.

But the ecological approach conceives of perception as largely obtained or embodied, and information is specific to the structure of stimulation. Consider, for example, if information were energy rather than structurally specific, the visual perception of a particular object or context would be possible only under an extremely narrow range of illumination. Detecting a particular kind of sound would be possible only at specific levels of sound, while the identification of a particular person would depend on a narrowly specified quantity of illumination. Even worse, passive reception of stimulation implies skeptical problems since the cause that excites a specific nerve cannot be verified. Such causes are unverifiable because knowledge and experience is limited to internal representations; anything beyond or beside representations are in principle

unknowable. As to the truth or falsity of the traditional doctrine of the senses, Gibson (1966) says that

> it holds for the senses considered as channels of sensation but not for the senses considered as perceptual systems. Information about the cause of arousal may not get into the nervous system through a single receptor but may well get into the nervous system through a combination of receptors. We may sometimes be aware of the state of a nerve. . . . But we are more likely to be aware of patterns and transformations of input that specify the causes of arousal quite independently of the specific nerves that are firing. (p. 38)

Skeptical problems are implied by the practice of attending to nerve states or representations of nerve *states* rather than *dynamic* patterns of input. Attention is directed inward to states of the self that are opaque to the understanding and, at best, highly ambiguous with respect to what lies beyond the self. Gibson (1979) says,

> Information is not specific to the banks of photoreceptors, mechanoreceptors, and chemoreceptors that lie within the sense organs. Sensations are specific to receptors and thus, normally, to the kinds of stimulus energy that touch them off. But information is not energy-specific. Stimuli are not always imposed on a passive subject. In life, one *obtains* stimulation in order to extract the information. (p. 243)

Attending to a nerve state or stimulus energy is more closely related to undergoing pain or excessive stimulation such as the glare of radiant light than to perceiving the world. Perception requires structure. For example, a "perfectly clear sheet of glass transmits both light considered as energy and an *array* of light considered information. A frosted or pebbled sheet of glass transmits optical energy but *not* optical information" (p. 152).

A paradox of traditional or physical optics is implied by the supposition that a structured visual perception can be constructed from unstructured radiant light. Traditional theories have been unable to show how information can be gleaned from radiant light, which has no discernable structure. Gibson (1966) says that

> we can escape the paradox by distinguishing between radiant and ambient light--that is, light emitted from an energy source and light reflected by the environment as a source. The conveying of information about surfaces by

> light of the latter kind is conceivable. To justify such a theory, however, the known laws of physical optics need to be supplemented with quite unfamiliar laws of ecological optics. (p. 186)

Without structure, perception is impossible. Light as pure energy is perceptually meaningless. Ecological optics is the study of light that is differentially reflected from the boundaries, faces, and textures of the surrounding environment. According to Gibson (1960),

> the term "ambient" suggests that the light surrounds an individual on all sides. . . . I wish to refer more particularly to the light which arrives from all directions and does so whether an individual is stationed at that position. If light has different intensities in different directions, instead of the same intensity in all directions, I propose to call it an *optic array*. It is an array because the various in intensity make an *arrangement*. (p. 254)

"Radiant light causes illumination" whereas "ambient light is the result of illumination" (Gibson, 1979, p. 51). Radiant light is homogeneous, but ambient light, being differentially reflected from structured surfaces, is heterogeneous.

When the senses are conceptualized as perceptual systems instead of isolated channels of sensation, the senses are understood in terms of functional specificity rather than anatomical or mechanically specific terms. The senses are *used* systematically, for example, when two anatomically separate or specific sense organs are used actively in a functionally unified manner in conjunction with an action system in order to detect information that specifies an affordance. This distinction is important because the senses used in a passively receptive manner frequently yield vague or ambiguous information, whereas using the senses in an active, systematic manner resolves ambiguities and illusions. Gibson (1966) discusses sound localization experiments in which the experimental subject is supposed to specify the source of a sound or at least which direction it proceeds from. According to traditional concepts of mind, there are "*cues* or *clues* for a perception of the direction of the source" of sound "relative to the head" (p. 84). Explaining further, Gibson (1966) says,

> In order to isolate them, experiments were performed with a blindfolded observer--with head held motionless at the center of a "sound cage"--whose task it was to point to or otherwise indicate the source of a sound. When localizing in this passive manner, the subject frequently made errors, confusing a direction in front of the head with a symmetrical direction in back of the head. The cues are indeed ambiguous in this respect. . . . These illusions of sound localization in the laboratory are the result of not permitting the ear-head system to explore and orient itself. When the head is allowed to move freely, the confusions disappear. (p. 84)

For Gibson, one ear by itself, one anatomically distinct sense organ, is less than half a functional unit. An auditory perceptual system requires two ears and a mobile head. Two ears and a rotating head can be used for locating the source of a sound because "the wavefront is specific to the direction of its source" (p. 81). The head is moved or rotated until a stimulus asymmetry or imbalance is balanced. The source is thereby made detectable. A balanced stimulus specifies the direction of the source.

Functional specificity also overlaps different active modes of attending. According to the anatomically reductive concept of perception, taste is a function of or reducible to stimulation of olfactory organs. Taste is supposed to be exclusively determined by olfactory information because when we lose our sense of smell, our sense of taste may also disappear. This conclusion seems self-evident insofar as we assume that taste and smell are mutually exclusive channels of passive receptivity. Gibson (1966), arguing otherwise, says that

> when we stubbornly continue to mean by *taste* a mode of attention that cuts across the classification of receptors we are only recognizing the fact that receptors may be functionally united when anatomically separated. In fact the word *palate*, although used in anatomy to mean the back of the mouth, it is used in gastronomy to mean the whole complex of receptors contributing to palatability, that is an organ of perception. (p. 173)

The functionally specific concept of perception appeals to what is for many a common sense intuition; taste is not reducible to smell but to what is sensed in both the nose and the mouth. Of course, it is easy to overlook the role of action systems in taste perception; food must be placed in the mouth, the mouth must be opened and closed, and so on.

Gibson also discusses an experiment with so-called depth perception. A subject is placed in a room that is designed to appear as a flat picture. The flat picture illusion persists until the subject moves, whereby the ambient array produces changes that cannot occur with a flat image. The occluding edge is the key. Gibson (1966) says that "as an object moves through the air it progressively covers and uncovers the physical texture of the wall behind it." (p. 203) Kinetic, not static, occlusion is what occurs in life. Gibson (1979) argues that "what we see is not depth as such but *one thing behind another*" (p. 77). The progressive uncovering and covering are a formless invariant that unambiguously specifies one thing behind another and are projected into the optic array as such because of exploratory action or movement. Perception should therefore be understood as *both* mental and physical, a function of extended and unextended order. Gibson explains that

> moving from place to place is supposed to be "physical" whereas perceiving is supposed to be "mental," but this dichotomy is misleading. Locomotion is guided by visual perception. Not only does it depend on perception but perception depends on locomotion inasmuch as a moving point of observation is necessary for any adequate acquaintance with the environment. *So we must perceive in order to move, but we must also move in order to perceive.* (p. 223, italics added)

The operation of the visual system cannot be reduced to any particular organ in isolation from others as the "eye-camera analogy" implies (p. 210). "The eye is never literally fixed. . . . The eyes normally search, explore, or scan, and there are seldom fewer than several saccadic jumps per second. They *look* but do not *fixate*" (p. 212). Staring at a fixed point, at most, is a limiting case of visual perception.

> Vision is a whole perceptual system, not a channel of sense. . . . One sees the environment with the eyes-in-the-head-on-the-body-resting-on-the-ground. Vision does not have a seat in the body in the way that the mind has been thought to be seated in the brain. The perceptual capacities of the organism do not lie in discrete anatomical parts of the body but lie in a system of nested functions. (p. 205)

The visual system operates as a kind of functional hierarchy. Corresponding to each level of the functional order is a particular ability for detecting invariants from the lowest to the highest level of functional order. First is the self-focusing single eye. Second, add the control muscles; next add the stabilized head. Fourth, add the other eye for increased visual acuity. Next consider the two eyes, the head, and the body as a whole system.

Gibson makes an important distinction between the epistemological status of consciousness of ones own sensory qualities and awareness of the world beyond one's own organs of sensation and action. Perceptual theory, Gibson (1966) argues, must "distinguish the input of the nervous system that evokes conscious sensation from the input that evokes perception" (p. 2). Gibson's concept of the embodied structure of perception and action is equivalent to Leder's (1990) concept of the from-to structure of perception and action. Input that evokes perception is absent from the field of perception whereas input that evokes conscious sensation implies perception of the self and disruption of objective perceptual activity. When the body is experienced as a thematic object of awareness, it is referentially ambiguous or even opaque to the structure of the world beyond itself. This is a key argument against the claim that perception is the viewing of internal representations of the external world.

Recall that for Leder (1990) the structure of perceiving and acting imply the "focal disappearance" of the central, *functional* organs of action and perception. The focal organs are completely absent from the field of awareness and action (p. 26). To the extent that they are present to awareness, intentionality is disrupted. This distinction reflects two poles of attention lying on opposite ends of a continuous loop, the subjective pole or the body "I have" and the objective pole or body as "I am." Gibson (1966) says that "there are two different meanings of the verb *to sense,* first, *to detect something*, and second, *to have a sensation*" (p. 1). When the senses are conceived as perceptual systems or active and functionally interrelated modes of attention, the first meaning is being used, but when the senses are conceived as "channels of sensation" or passive and isolated

modes of awareness, the second meaning is being used (p. 1). The "senses" "considered as active systems" are "classified by modes of activity" such as looking, listening, tasting, smelling, or touching, "not by modes of conscious quality" (p. 49). Perceiving means that attention is directed to what there is to be perceived beyond awareness of the body or self. Gibson (1966) says that the "remarkable fact is that when a man touches something with a stick he *feels* it at the end of the stick, not in the hand. . . . The sensations in the hand itself are irrelevant" (p. 101). Perception is therefore not based on consciousness of sensory arousal but on the detection of information that specifies the changing and nonchanging features of objects and the world. Explaining further, Gibson says that "*detecting* something can sometimes occur without accompaniment of sense impressions. . . . [S]timulus information can determine perception without having to enter consciousness in the form of sensation" (p. 2). This is an implicit recognition of what Leder (1990) introduces as a general principle: a functional organ or group of perceptual organs serve to disclose a world insofar as it recedes from awareness.

Although traditional approaches assume that the abstract space of geometry and abstract time of physics are essential for perception of the world of qualitative experience and action, they are not experienced immediately or directly. Such abstract and general concepts logically complement the hypothetical mental processes of passively receptive, immobile observers. The concept of an ideally stationary or static spectator implies a complete absence of dynamic posture, a moving organism's orientation to an environment. Environmental orientation, a necessary condition for control of action and exploratory action, cannot be specified by homogeneous space or time. The standard solution is that orientation is solely a function of psychological construction processes; however, an ecological solution depends on *exploration* of a differentiated or concretely structured environment. Gibson (1979) explains that

> the standard approach never gets around to ambient vision with head turning [looking around], and does not even consider ambulatory vision

> [moving around while looking around]. The process of perception is supposed to be *localized in the head, not in the muscles*, and begins after the sensory input reaches the visual projection area of the cerebral cortex. The mind is in the brain. (p. 303, italics added)

Gibson argues that concepts of space and time have nothing to do with perception in the world of action. Perception is not blind without concepts. The space and time of qualitative experience are heterogeneously structured. Perception of concrete objects is a function of adjacent or simultaneous order, while perception with respect to time is a function of successive order. Past successive order, in contrast to adjacent order, cannot be reorganized. We directly perceive objects and their layout or organization over time as they are progressively revealed through exploratory movement or action. *The perceptual process must therefore begin with the use of the muscles.* The space or simultaneous order of qualitative experience specifies up and down because it is structured according to "the law of strong light from above and weak light from below. . . . [T]his difference is ordinarily coincident with the pull of gravity and the push of the substratum" (Gibson, 1966, p. 156).

Gibson (1979) says that there "is no such thing as a perception of space without the perception of a continuous background surface" (p. 148). Standard approaches frame perception of space and distance in term of an "*air theory*," whereas Gibson talks in terms of "*ground theory*" (p. 48). Explaining further, Gibson says that

> distance *of itself* is invisible and, if so, a whole set of perplexities arise that have never been resolved. Distance may be thought of, however, as extending along the ground instead of through the air, and then it is *not* invisible. It is projected as a *gradient* of decreasing optical size and increasing optical density of the features of the ground. (p. 117)

Such gradient changes themselves are formless invariants that specify size and distance from here. To conceive of perception in terms of invisible distances is to "confuse abstract geometrical space with the living space of the environment" (p. 117). The relations between visible objects and surfaces projected into the optic array are the

formless invariant structures that specify size and distance. Referring to the conclusions of experimental studies, Gibson explains:

> No matter how far away an object was, it intercepted or occluded the same number of texture elements of the ground. This is an invariant ratio. For any distance the proportion of the stake extending above the horizon to that extending below the horizon was invariant. This is another invariant ratio. These invariants are not cues but information for direct size perception. (p. 160)

Cues must be supplemented, completed, corrected, or made coherent, whereas invariant information *self-sufficiently* specifies what there is to be perceived.

The ecological approach reconceptualizes perceived time in terms of ecological events. According to Gibson (1979), an "*event* is any change of a substance, place, or object, chemical, mechanical, or biophysical. The change may be slow or fast, reversible or nonreversible, repeating or nonrepeating. Events include what happens to objects in general, plus what animate objects *make* happen" (p. 242). "*Ecological events*, as distinguished from microphysical and astronomical events, occur at the level of substances and surfaces that separate them from the medium" (p. 93). "*Substances* are solids and liquids that vary in composition, and resistance to change" (p. 307) "*Surfaces* and the *medium* are ecological terms; *planes* and *space* are the nearest equivalent geometrical terms" (p. 33). Planes are colorless and transparent, whereas surfaces are opaque and substantial. Space is homogeneous, whereas the environmental medium is to a greater or lesser extent cluttered by objects that occlude one another and other surfaces such as the ground. Ecological events occur at neither the microscopic nor the macroscopic level but at the levels relevant to perception and control of action.

> The reality underlying the dimension of time is the sequential order of events, and the reality underlying space is the adjacent order of objects or surface parts.Sequential order is not comparable to adjacent order; it is not even analogous to adjacent order. (p. 101)

Reorganization of past events is impossible, whereas the reorganization of adjacent order is always, at least, a possibility. Ecological events are substantial or concrete, whereas the

abstract passage of time in physics, conceived as another dimension of space, is a ghost of more substantial events. The time of qualitative experience is the flow of ecological events. The flow of *qualitative* time or

> the flow of ecological events is distinct from the abstract passage of time assumed in physics. The stream of events is heterogeneous and differentiated into parts, whereas the passage of time is supposed to be homogeneous and linear. . . . We should begin thinking of events as the primary realities and of time as an abstraction from them. . . . Events are perceived but time is not. (Gibson, 1979, p. 100)

Perception acquires an abstract, contemplative quality as it is withdrawn from lived experience. In principle the exclusion of movement and qualitative space also excludes even the abstract passage of time from experience.

Reducing observation to passive, immobile exclusively frontal viewing implies some extremely meager possibilities for visual perception. Gibson (1979) says that

> the standard approach to vision begins with the eye fixed and exposed to a momentary pattern of stimuli. It then goes on to consider vision with the head fixed and the eye allowed to explore the pattern by scanning it, that is by looking at parts in succession. Each fixation is a glimpse of the pattern comparable to a momentary exposure and is thus supposed to be analogous to a photographic snapshot taken by a camera with a shutter. Each successive snapshot is assumed to be transmitted to the brain. The result of this is *aperture vision*, a sequence of snapshots. (p. 303)

A comparable kind of seeing in ordinary life would be looking through a hole in a wall or fence. The notion of a momentary or static visual image is more difficult to demonstrate in ordinary experience, which emphasizes continuity. Although the concept of a succession of static instants, momentary fixations, snapshots, or static parts implies at least the abstract passage of time, perception and experience are in principle restricted to the present moment or static instant. That is to say, perception is reducible to awareness of the momentary arousal of sensation or sense-impression. Since awareness transcending the present moment sense-impressions is either a function of memory of the past or imagination of the future, experience of temporality and continuity are not facts of

experience but psychological constructions known only by the intellect or unextended mind.

Although the individual can be a stationary spectator and think of the field of visual perception in terms of static images, such an introspective attitude lies at the opposite pole of attention from that which makes perception possible--the natural attitude, whereby attention is directed outward. The visual environment that is specified in the unbounded ambient optic array is for the *moving* observer progressively revealed through the evolution of the exploratory act as surfaces are progressively covered and uncovered or become projected and unprojected into the ambient optic array until a whole layout is specified. Gibson (1979) explains that the "seen-from-here" and the "seen-at-this-moment" is a "very small sample of the whole world, however, what we perceive is the world" (p. 197). Perceiving the unbounded world goes far beyond the narrow bounds of stationary, frontal viewing. The evolution of exploratory movement or action over real time is essential.

> What we see *now* refers to the self, not the environment. The perspective appearance of the world at a given moment of time is simply what specifies to the observer where he is at that moment. The perceptual process does not begin with this peculiar projection, this momentary pattern. The perceiving of the world begins with the pickup of invariants. (p. 254)

Invariants are unambiguously and clearly detected against a context or background of changing stimulation. Exploratory movement or overt investigative motor activity produces, for the actor, global and local changes in stimulus information that makes information specifying nonchange detectable. Attention must be directed outward beyond the self and this momentary perspective appearance. But attending to a momentary perspective appearance draws attention inward and what is seen now becomes a thematic object of perception that displaces perception of the world beyond. Because traditional theories assume that perception is independent of action and a function of the inner pole

of attention, the resolution of ambiguous or equivocal stimulation is the responsibility of purely psychological construction processes. Without an adequate presupposition of embodiment, perhaps, there is no other alternative. But for Gibson, *actions* are construction processes and, unlike psychological construction processes, do not imply paradoxes or incoherencies.

According to Gibson, geometrical habits of thinking play a key role in forming the traditional epistemological and ontological distinction between time and space. Change is assumed to be exclusively a function of time and nonchange or invariance exclusively a function of space. Change is a succession of discontinuous, non-identical but resembling, bounded, and static spatial forms. Gibson (1979) explains, "The geometrical habit of separating space from time and imagining sets of frozen forms in space is very strong. One can think of each point of observation in the medium as stationary and distinct" (p. 74). Anyone who has done elementary Euclidean geometry knows how easy it is to think about bounded and static or timeless spatial forms. Although the concept of timeless forms or space is easy to transfer to psychological theory in the form of momentary or punctate episodes of stimulation in order to develop a traditional or non-ecological concept of mind, the structure of embodied experience implies the implausibility of such an idea. According to the logic of reductive concepts of mind, nonchange should be exclusively a function of the present moment and known only by the presence of sensory arousal; whereas, change across time corresponds to an absence of sensory arousal. Absences must be filled in by psychological construction processes; experience of a continuous self and world or unambiguous perception of invariant form is the result of such filling in. Temporal continuity is not a matter of experience but purely psychological.

The atomistic components of a present-moment reduction of experience are not definable in terms of perception of temporally conditioned meaning-structures or qualitative experience but only in the hopelessly vague or ambiguous terms of

consciousness of sensory impressions or episodes of sensory arousal. Experience and reality according to traditional epistemology and psychology is fundamentally atomistic or discontinuous. Gibson (1979) explains,

> The old approach to perception took the central problem to be how one could see into the distance and never asked how one could see into past and future. These were not problems for perception. But this theory has never worked. No one could decide how long the present lasted, or what distinguished memory from imagination, or when percepts began to be stored, or which got stored, or any other question to which this doctrine led. The new approach to perception, admitting the coperception of the self to equal status with perception of the environment, suggests that the latter is timeless and that present-past-future distinctions are relevant only to awareness of the self. (p. 195)

Perception of the environment and the self is timeless in the sense that it is not confined to the meager bounds of some hypothetical present moment that is categorically distinct from the past or memory of the past and the future or imagination of the future. Although the "division between present experience and past experience may seem to be self evident," it is "denied in supposing that we can experience change and nonchange" (Gibson, 1979, p. 253).

For Gibson, perception is understood in terms of the detection of observer independent continuity of objects and events over time. Perception is a temporal process also in the sense that during the progressive evolution of an exploratory act, invariants are directly detected because of change. Gibson thinks about perception more in terms of functionally unified, successively and simultaneously ordered events of qualitative experience than in terms of abstract and discontinuous time and space mathematics or physics. *Perception is timeless in the sense that it spans both orders; with respect to perception both orders are equivalent.* Gibson (1966) explains that

> the essence of memory as traditionally conceived is that it applies to the past, in contradistinction to sense perception, which applies to the present. But this distinction is wholly introspective. It depends on the feelings of "now" and "then," not on the facts of life. The experience of "now" is the result of attention to the observer's own body and to impressions made on

> it--to sensation, not perception. *Information* does not exist exclusively in the present as distinguished from the past or future. What is exclusively confined to the present is the momentary sensation. (p. 276)

Gibson frequently comments that in psychological experiments it is nearly impossible to get subjects to report sensations and that the overwhelming tendency for most people is to report objects of perception. Gibson explains that "physical events conform to the relation of before and after, not the contrast of past and future. Resonance to information, that is, contact with the environment, has nothing to do with the present" (p. 276). Sensation is not basic for but only incidental to perception.

For Gibson, perceiving continuous existence of things is not a function of continuous awareness of anything. The difference between presence and absence is a fact of experience considered holistically; however, there is no clearly and distinctly defined dichotomy between the two. Gibson (1979) says,

> The stream of experience does not consist of an instantaneous present and linear past receding into the distance; it is not a "traveling razor's edge" dividing the past from the future. Perhaps the present has a certain duration. If so, it should be possible to find out when perceiving stops and remembering begins. But this has not been possible. There have been attempts to talk about a "conscious" present, or a "specious" present, or a "span" of present perception, or a span of immediate memory, but they all founder on the simple fact that there is no dividing line between present and past, between perceiving and remembering. (p. 253)

Because episodes of sensory arousal cannot be accounted for in terms of real time, they cannot be used to explain perception. "A special sense impression clearly ceases when the sensory excitation ends, but a perception does not. It does not become a memory after a certain length of time. A perception, in fact, does not *have* an end. Perceiving goes on" (p. 253). A path of observation or even a long-term journey, understood here as a sequence of transitions from one vista to another, can be perceived as a continuous or unified movement and visual perception. Such paths may be sort or long and last for "hours, days, and years" (p. 197).

Although perception is based on the detection of invariant features of the environment, it is generally goal-directed or functionally specific. Gibson says, "*The affordance of anything is a specific combination of properties of its substances and its surfaces taken with reference to an animal*" (p. 75). Affordances are objective or invariant structures that are defined as "invariant combinations of variables" that have meaning for an organism. Affordances are thus invariant structures that function as meaning-structures. Invariant structures are observer-independent or perceiver-independent in the (ecological) sense that they exist as invariant structures whether they are or are not perceived. Observer-independence, however, does even suggest separate objective and subjective orders of existence. Meaning is the ongoing potential for such structures. Mace (1977) explains that "affordances constitute a partitioning of the environment with an organism in mind instead of, say, the more neutral partitioning of the environment of energy flux into observer-independent properties of classical physics" (p. 59).

Orthodox psychology asserts that perception of ordinary or concrete and value-rich objects such as tools, utensils, or weapons is reducible to discrimination of abstract, value-neutral physical properties such as "color, texture, composition, size, shape and features of shape, mass, elasticity, rigidity, and mobility" (Gibson, 1979, p. 134). Gibson (1979) explains that

> orthodox psychology asserts that *we perceive these objects insofar as we discriminate their properties or qualities*. Psychologists carry out elegant experiments in the laboratory to find out how and how well these qualities are discriminated. The psychologists assume that the objects are *composed* of their qualities. (p. 134)

Variables or abstract physical properties are perceived separately and subsequently used as raw material for the construction of a coherently structured concrete perception or representation. But according to the ecological approach, we generally perceive functional combinations of variables first, and analysis or discrimination of isolated

qualities or special combinations of qualities--if it occurs at all--usually comes later. Gibson says,

> But now I suggest that what we perceive when we look at objects is their affordances, not their qualities. We can discriminate the dimensions of difference if required to do so in an experiment, but what the object affords us is what we normally pay attention to. The special combination of qualities into which an object can be analyzed is ordinarily not noticed. (p. 134)

According to the functionally specific understanding of perception, orthodox or reductive approaches have inverted the actual organization of successful perceptual processes. Gibson (1979) elaborates:

> Phenomenal objects are *not* built up of qualities; it is the other way around. The affordance of an object is what an infant begins by noticing. The meaning is observed before the substance and surface, the color and form, are seen as such. An affordance is an invariant combination of variables, and one might guess that it is easier to perceive such an invariant unit than it is to perceive all the variables separately. (p. 135)

Attending to isolated qualities of experience instead of invariant combinations of variables or invariant units implies a reversal of what Leder (1990) refers to as the "threefold telos of motility" (p. 20). Insofar as attention is shifted away from the object of perception and goal of action and toward the isolated particulars of the supporting medium or context of activity, the medium itself becomes a problematic object of awareness and activity is impeded or is more difficult to pursue. Orthodox psychology, like Descartes, supposes that our unambiguous grasp of invariants is exclusively a function of propositionally based abstract conceptual thought; however, orthodox psychology expanded the scope of Cartesian idealizations. Psychological theorists traditionally assume that value-neutral conceptual thought or construction processes are necessary for unambiguously structured perception of the world not only of mathematical reflection but of value-based ordinary experience and action as well.

According to the ecological concept of mind, affordances are directly perceived features of the environment that integrate subjective and objective references and provide a unified basis of perception and action for an organism. Affordances are a basis of self-knowledge, since what a unique combination of variables can specify is an actor's capacities for action and perception as well as related needs and interests. Affordances are objects of desire and positive value or aversion and negative value. Gibson (1979) explains,

> The affordances of the environment are what it *offers* the animal, what it *provides* or *furnishes*, either for good or ill. The verb *to afford* is found in the dictionary, but the noun *affordance* is not. I have made it up. I mean by it something that refers to both the environment and the animal in a way that no existing term does. It implies the complementarity of the animal and the environment. (p. 127)

For example, a surface might afford locomotion; an object might afford grasping; an opening might afford passage; an object might afford eating or being eaten; or an object might afford throwing or hammering. An affordance is for a particular kind of animal or individual insofar as it can be perceived, acted upon, and can be used to satisfy a need or desire. That is to say, my capacity to act and perceive determines what for myself is an affordance. As our ability to act and perceive grows or diminishes, so does the scope of what the world affords. An affordance therefore specifies the requirements of agency and the agent. Self-knowledge is specified by what there is to be perceived and acted upon. Functionally, Gibson (1979) says,

> An affordance . . . points two ways, to the environment and to the observer. So does the information to specify an affordance. But this does not in the least imply separate realms of consciousness and matter, a psychophysical dualism. It says only that the information to specify the utilities of the environment is accompanied by information to specify the observer himself, his body, legs, hands, and mouth. . . . [E]xteroception is accompanied by proprioception--that *to perceive the world is to coperceive oneself*. . . . The awareness of the world and of one's complementary relations to the world are not separable. (p. 141, italics added)

Affordances are inseparable from goal-directed action. Like Hume, Gibson rejects the idea of the double existence, but for Gibson explaining perception of the difference between the self and what lies beyond does not depend on an assumption of different orders of existence. For example, "locomotion of the self" is specified by a "global change of the perspective structure," whereas the motion of other persons or objects are specified by a "local change in the perspective structure" (p. 74). Both are uniquely specified by the same kind of information and simultaneously picked up by the same perceptual system by means of a unified exploratory process.

Although the value of an affordance is specified by the abilities and interests of capable and interested animate organisms, its continuing or persisting existence is mind independent or distinct. The grasp of value-neutral properties is not an unequivocal reality test for the mind-independent and continuous existence of anything. Gibson (1979) says that

> the affordance of something does *not change* as the need of the observer changes. The observer may or may not perceive or attend to the affordance, according to his needs, but the affordance, being invariant, is always there to be perceived. An affordance is not bestowed upon an object by a need for an observer and his act of perceiving it. The object offers what it does because it is what it is. (p. 139)

Although what an object affords is its subjective reference and may be selected from a range of other possible values, such values are *not* reducible to what appears through the sense organs. There is no resemblance. The needs, interests, and capacities of an organism narrow the range of possibilities and therefore determine which invariant-structures will become meaning-structures or affordances. Objects, substances, surfaces, and organisms may provide either positive or negative affordances. Gibson (1979) explains,

> First, consider the substances that afford ingestion. Some afford nutrition for a given animals, some afford poisoning, and some are neutral. . . . Second, consider the brink of a cliff. One side of it affords walking along, locomotion, whereas on the other it affords falling off, injury. Third,

> consider a detached object with a sharp edge, a knife. It affords cutting if manipulated in one manner, but it affords being cut if manipulated in another manner. . . . And fourth, consider the other person. The animate object can give caresses or blows, contact comfort or contact injury, reward or punishment, and it is not always easy to perceive which will be provided. (p. 137)

None of these values is reducible to subjective experience or felt sensations. None are appearances in a theater of consciousness. All are based on publicly observable events and objects. The verification of what something affords, its use value, is itself a kind of reality-test. Gibson, explaining further, says,

> Note that all these benefits and injuries, these safeties and dangers, these positive and negative affordances are properties of things *taken with reference to an observer* but not properties of the *experiences of the observer*. They are not subjective values; they are not feelings of pleasure or pain added to neutral perceptions. (p. 138)

Values have both subjective and objective components. Affordances are the objective, independently and continuously existing objects that are defined in terms of use value.

For orthodox psychology, "bare sensations" must be "clothed with meaning" (Gibson, 1979, p. 140). But as Gibson argues, affordances are both a source of coherent perceptual information and value. The home of value is not in-the-mind but in-the-world. The properties of the extended objects of geometry and physics are traditionally thought to be the sole basis of veridical perception. Explaining further, Gibson (1979) says that

> the perceiving of an affordance is not a process of perceiving a value-free physical object to which meaning is somehow added in a way that no one has been able to agree upon; it is a process of perceiving a value-rich ecological object. Any substance, any surface, any layout has some affordance for benefit or injury to someone. Physics may be value-free but ecology is not. (p. 140)

For ecological psychology, affordances are neither exclusively in the subjective world nor exclusively in the objective world, since "the theory of two worlds is rejected. There is only one environment, although it contains many observers with limitless opportunities for them to live in it" (p. 138). Because subjectivity and objectivity are in the same world, values are "perceived immediately" and "directly" (p. 140). An affordance is "equally a

fact of the environment and a fact of behavior. It is both physical and psychical, yet neither. An affordance points both ways, to the environment and the observer" (p. 129). Affordances are neither exclusively subjective properties nor exclusively objective properties but a combination of both.

According to the ecological approach, we can directly perceive rigid, solid objects as solid, unified, whole, and of constant form even though their surfaces are largely hidden from view or covered. Consider several objects placed on the floor in the corner of a room, some in front of the others so that the near sides of only the nearest object are completely uncovered. Typically we can identify any of the objects in terms of its shape even though the far sides and much of the near sides are not projected into the ambient optic array. Identification is easily performed from an unlimited number of viewing angles. Hence the many different transformations of form projected into the ambient optic array do not disrupt the identification of the object as, say, square, spherical, rectangular, or triangular. Orthodox concepts of mind suppose that such recognition is based on unconscious inferences of dimensions of depth and constant shape and subsequent construction processes that produce veridical, inner representations. Only from the momentary perspective of the stationary observer who passively receives isolated forms or images are the incoherencies or paradoxes of perceiving unperceived surfaces and inferring constant form from inconstant forms necessary implications. Insofar as such an introverted or unnatural attitude can in fact be practiced, such problems are realized.

The ecological approach frames the solution in terms of direct detection of *formless* invariants that are made available under optical *transitions* and *transformations*. While formless invariants of optical transition specify the continuous existence of hidden or covered surfaces, formless invariants of optical transformations specify constant form. Through the evolution of exploratory movement over time or through the observation of observer-independent motion over time or through both, the hidden and unhidden faces

of objects are specified in ambient light and therefore are experienced and seen as continuous or unified. Like self-perception, perception of what lies beyond the self depends on what is absent from *and* present to awareness. Invariants under optical transformation are projected into the optic array because of subjective and objective movement. Changes projected into the optic array make the detection of invariance possible. *Since both optical transitions and transformations can be produced for the observer by his or her goal-directed action, the theoretical problems of object constancy and continuing identity are not implied by ordinary experience*. Many of the puzzles of traditional epistemology are facts of motionless, passive observation, not facts of unimpeded action. Let us, first, examine stationary and ambulatory observation; second, examine optical transitions, and, then, move on to optical transformations.

Striking differences in practical implications follow from ecological and orthodox or reductive assumptions. Ecological psychology helps us to think in terms of a much wider range of experience. Gibson (1979) says, "Looking-around and looking-at are acts that naturally go together, but they can be studied separately. In fact, looking-at has been studied almost exclusively by visual physiologists. . . . The head is usually fixed in an apparatus" (p. 209). Instead of conceiving of visual perception as a succession of fixed and disinterested gazes, a purposeless stare, or in terms of the "eye-camera analogy," the ecological concept of mind is framed in terms of the "natural exploratory activity of the visual system" (p. 211). The emphasis is on looking-around or ambulatory seeing. Seeing is much more important than aimless staring. Gibson explains,

> A point of observation at rest is only a limiting case of a point of observation in motion, the null case. Observation implies movement, that is locomotion with reference to a rigid environment, because all observers are animals and all animals are mobile. . . . The point of observation normally proceeds along a path of locomotion and the "forms" of the array change as locomotion proceeds. (p. 72)

A fruitful account of perception must account for perception as it proceeds in the world of the natural attitude or ordinary, common-sense reality.

Perceiving the layout of the environment visually cannot be reduced to what is momentarily projected into the ambient optic array while seen from a stationary point of view. Gibson (1979) argues that

> the layout of the environment includes unprojected (hidden) surfaces at a point of observation as well as projected surfaces. Things are seen *in the round* and one thing is seen *in front* of another. How can this be? Information must be available for the whole layout, not just for its facades, for the covered as well as covering surfaces. (p. 76)

Because sensation based or reductive accounts of perception define perceiving exclusively in terms of present-moment sensations, occluded surfaces are either remembered (in memory) or anticipated (in imagination). Hence, while I sit at my desk, the area occluded or hidden by the desktop is not perceived but only known *mentally*. Also while I am driving an automobile, I may look to the left or right in order to look in the mirror or read a road sign. Reductive theory implies that the road ahead is no longer perceived but only remembered or expected. The layout as a whole is not perceived but known only insofar as it can be represented mentally. The absurd implication is that occluded surfaces and those not directly in front of the eyes are for the observer no longer *known* to exist.

Ecological theory explicitly claims that occluded surfaces can be directly perceived by means of optical transitions. Information that specifies covered surfaces is projected into the ambient optic array. Movement produces optical transitions whereby information that specifies hidden surfaces is made available for an observer. A relatively minute amount of observer-independent movement or observer-produced exploratory movement (or action) or both is enough to produce the desired transition. An optical transition is produced by an opaque object moving in front of a textured surface. The leading edge of the moving or occluding object progressively deletes the texture of the

surface behind it while the trailing edge of the occluding object processively uncovers texture. That is to say, there is a progressive deletion and accretion of texture. Gibson, beginning with the easier to accept presupposition that the edges of covering surfaces are specified in light, proposes that covered surfaces are specified as well. He says that "information is implicit in the *edges that separate* the surfaces or, rather, in the optical specification of these edges. I am suggesting if covering edges are specified, both the covered and covering surfaces are also specified" (p. 76).

Now suppose that you are facing a textured surface, say, a wall. In between you and the wall stands a stationary object that partly covers the wall behind it. As you move to the left, the leading edge of the object deletes texture on your right while at the trailing edge texture is accreted. As you move to the right in the same manner, the transition is reversed. Even your slightest movement to the left or right makes information specifying a one thing in front of another relation and the unity of the covered surface available for perception. Whatever goes out of sight as an observer moves in one direction comes back into sight as he or she moves in the opposite direction. Gibson (1979) says that "the generality of this principle has never been realized; it applies to the shortest locomotions, in centimeters, as well as to the longest in kilometers. . . . I will call it the *principle of reversible occlusion*" (p. 77). A "one-to-one mapping over time" or "projective correspondence" is not essential for perceiving the continuing or persisting existence or identity of a surface (p. 108). An optical transition is a formless invariant that specifies the continuing existence of the unprojected surface. Gibson (1979), defining perception, says,

> To perceive is to be aware of the surfaces of the environment and oneself in it. The interchange between hidden and unhidden surfaces is essential to this awareness. These are existing surfaces; they are specified at some point of observation. Perceiving gets wider and finer and longer and richer and fuller as the observer explores the environment. The full awareness of surfaces includes their layout, their substances, their events and their affordances. (p. 255)

The interchange between the hidden and unhidden surfaces is essential for perception of persistence. Gibson says that "if the texture that is progressively covered has the same structure as the texture that is progressively uncovered the unity of the [occluded] surface is well specified" (p. 82). A "pause in locomotion calls attention to the difference between the hidden and unhidden, whereas locomotion makes evident the continuousness between the hidden and unhidden" (p. 86). The discontinuity or disunity of what is absent from and present to conscious awareness and lies beyond the self is logically implied by the concept of non-temporal perception and empirically realized by stationary and meaningless observation.

For Gibson (1979), it is a "radical hypothesis" to propose that a formless invariant such as an optical transition can specify an occluded object's or surface's continuing identity or persisting existence. The "persistence of an object is perceived as a fact in its own right. There is a vast difference between the persistence of a percept and the perception of persistence" (p. 191). "To pick up the invariant is to perceive the persistence of the surface" (p. 209). Consequently, there is no need for the "concept of object permanence" or *continuing* identity (p. 209). Detection of the invariant specifies the same thing over time. Perception does not stop when stimulation stops. Gibson explains:

> To say that one is aware of the environment behind one's head is to say that one is aware of the *persistence* of the environment. Things go out of sight and come back into sight as the head turns in looking around, but they persist while out of sight. Whatever leaves the field as one turns to the right re-enters the field as one turns to the left. The structure that is deleted is later accreted; this is a reversible transition, and therefore the structure can be *invariant* under transition. (p. 209)

The persistence or continuing existence of an object or surface is specified by "invariants of structure, not by the persistence of stimulation. Persisting stimulation of the retina or skin specifies no more than the absence of movement and sense perception soon fades out by sensory adaptation" (p. 248).

Referring to experimental studies in which subjects observed optical transitions, Gibson (1979) says,

> All observers, without exception, saw one surface going *behind* another (or *coming from* behind another) that was always concealing (or revealing) the first. Deletion always caused the perception of covering, and accretion always caused the perception of uncovering. The surface going out of sight was never seen to go out of existence. In short, one surface was seen in a legitimate sense *behind* another at an *occluding edge*. (p. 190)

Persistence or continuous existence was also perceived easily, confidently, and reliably.

> The surface that was being covered was seen to persist after being concealed, and the surface that was being uncovered was seen to pre-exist before being revealed. The hidden surface could not be described as remembered in the one case and expected in the other. (p. 190)

Contrary to the "accepted doctrine," it is "certainly reasonable to describe perception as extended into the past and future" (p. 190). Perception is a temporally conditioned activity. Because, through time and exploratory movement, we directly perceive the layout of an environment as a whole, we do not need concepts or inferences and intellectual construction processes in order to transcend the "seen-now-from-here" (p. 201). Gibson elaborates:

> To adopt the point of view of another is not an advanced achievement of conceptual thought. It means, *I can perceive surfaces hidden at my point of view but unhidden at yours*. This means, *I can perceive a surface that is behind another*. And if so, *we can both perceive the same world*. (p. 200)

The puzzles of egocentric perception are not implied by the ecological concept of mind. Since invariants can be detected from a wide range of different perspectives and observers look around while moving around, "the same invariants under optical transformations and occlusions will be available to all. To the extent that the invariants are detected, all observers will perceive the same world." (p. 200).

Perception of constant or invariant object shape or form in the midst of optical transformation or change of shape is another source of incoherency for orthodox psychological theory. For instance, my desktop is rectangular and almost anyone can

easily and unambiguously perceive its shape from an unlimited variety of viewing angles. Generally, we do not see such forms projected into the ambient optic array as a rectangle with 90° angles on each corner. The angles projected into the array are usually wider and narrower than 90°, while sides may be projected as converging rather than parallel. The only restriction on the variation of projected form is the fact that the desktop has four sides. As long as I am moving or the object is moving, the projected form changes. For most observers, such objects are almost never projected into the optic array in the form of parallel sides and 90° angles. The required perpendicular viewing angle is usually very impractical. Even so, most observers can easily and reliably identify the shape of such objects from any of an unlimited number of viewing angles. Such perceptual constancy is traditionally attributed to inferences and subsequent mental constructions of some essential form that supposedly underlies the many forms of experience. A succession of distinct but resembling forms are the mere appearances of experience, whereas the essential or real form is the source of invariance.

The problem for orthodox theory is to explain how the ambiguous and incoherent appearances or forms of experience yield an unambiguous and coherent perception of shape. But how can perception of constant form be based on inconstant form? Gibson's (1979) answer is that the shape of objects is specified by "invariants that are themselves 'formless'" (p. 168). Such invariants "cannot be pictured" (p. 229). According to Gibson, perceiving of "forms" is not basic to perception. An "object is specified by *invariants under transformation*. Far from being forms, these invariants are quite 'formless'; they are invariants of structure" (p. 178). Change and nonchange in optical stimulation are complementary. Generally, the unambiguous detection of invariant form is enhanced by the multiplication of viewing angles whereby optical changes or transformations are obtained. Gibson says,

> There are variants and invariants in any transformation, constants and variables. Some properties are conserved and others are not conserved. . . .

> The point to be noted is that for persistence and change, for variant and invariant, each term of the pain is reciprocal to the other. (p. 13)

Gibson argues that what "counts is not form as such but dimensions of variations of form" (p. 150). The "radical hypothesis" is that "what the eye picks up is a sequential transformation not a form" (p. 150). Unlike optical transitions, optical transformations by definition "preserve one-to-one correspondence of units over time" (p. 108).

Gibson reconceptualizes perception of the desk or tabletop. Although we "tend to think of each member of the set of trapezoidal projections from a rectangular object as being a form in space" and change as a "transition from one form to another," this "habit of thought is misleading" (p. 74). Part of the problem is our "geometrical habit of separating space from time and imagining sets of frozen forms in space" (p. 74). And from each non-temporal perspective we perceive a different form or distinctly bounded, picture-like image. But this "does not allow for the complexities of optical change and does not do justice to the fact that the optic array *flows in time* instead of going from one structure to another" (p. 75). A discontinuous succession of optical forms is a one-way psychological process. Looking at the same thing again implies a new succession of representations. Recognition of the same is based on inferences. Optical change, however, is a "reversible process" (p. 74).

> What are the invariants underlying the transforming perspectives from the tabletop? What specifies the shape of this rigid surface as projected to a moving point of observation? Although the *changing angles and proportions* of the set of trapezoidal projections are *a fact*, the *unchanging relations* among the four angles and the invariant proportions over the set are *another fact*, equally important, and they *uniquely specify* the rectangular surface. (p. 74, italics added)

The unchanging relations are the formless or nonvisualizable invariant structure or symmetry that persists through progressive transformation of the optic array. Although the object is rigid, its projection exhibits changing lengths, angles, and overall size. Optical transformations produced by movement of the observer, or the object, or both, progressively disclose or make available information that specifies the invariant shape or

form. Even though the optic array specifies the object shape, its measurable or quantifiable properties are specified by but not projected as such into the optic array. The optical projection of the object does not resemble the object and therefore is not a copy or representation. Invariants of structure or symmetries are defined as "topological," nonmetric or, perhaps, qualitative (p. 108).

Shaw and Pittenger (1977) argue that perception cannot be adequately understood in terms of Euclidean geometry and space. We need to think more in terms of *living* space or "*information* space" (p. 107). These researchers focus on the perception or recognition of equivalent shapes in spite of growth, aging, or nonrigid transformations of form or shape. Face recognition is the primary example. Growing and aging faces change both in size and shape over time.

> In spite of such gross changes, older faces are still readily recognized as being transforms of younger ones seen earlier rather than being new faces never before seen. . . . It is also quite common to recognize the common species of plants or animals in spite of the fact that they may be at different stages of growth. (p. 117)

Metric Euclidean geometry is too restrictive to describe the structural invariant that specifies the growth transformation of a particular plant, animals, or face. Shaw and Pittenger describe a hierarchy of progressively less restrictive geometries. Metric Euclidean geometry is the most restrictive, while nonmetric topology is the least restrictive. The symmetry operations of Euclidean geometry always preserve an object's rigidity or metric properties.

> By a rigid object (or shape) we mean one such that the distance between any pair of points on its surface remain unchanged when the object is transformed by displacement or reflection. A transformation that leaves a property (for example, rigidity) invariant is called a *symmetry* operation or *transformational invariant* of the space (for example, rotation). A full set (or group) of transformations which constitute symmetry operations for rigid objects (that is, leaves their shape unchanged) is exactly what we mean by Euclidean geometry. Rotation, translation, and reflection are the transformational invariants of Euclidean space (sometimes called the Euclidean group). The properties which remain invariant under the

> geometric transformations are usually called *symmetries* or *structural invariants* of the space. For instance, rigidity is a symmetry or structural invariant of Euclidean space. (p. 113)

A more restrictive geometry preserves a greater number of symmetries or structural invariants under symmetry operations. Rigidity is clearly not a symmetry of the information space that is used to describe facial recognition invariants. Of course, neither is shape. An infant's diminutive face and relatively large cranium are forms modified by growth. There is also similarity space in which size and shape symmetries are broken. We easily recognize the resemblance between a toy car and a real one or a doll and a human being.

As more symmetries are broken, corresponding equations that are used to specify the resulting shapes or forms progressively become more complex.

> Thus we can see that the concept of equivalent shapes becomes more complex because the equation specifying the shape invariant involves an ever increasing number of terms to be evaluated as well as operations to be performed. Even more interesting for perception, however, is the fact that in each subsequently weaker space the information specifying the shape invariant becomes considerably more abstract in the technical sense that fewer and more subtle properties of the space remain invariant. . . .[T]o construct weaker geometries you augment the Euclidean group of transformations with an ever increasing number of symmetry-breaking or invariant-destroying operations. (Shaw & Pittenger, 1977, p. 116)

Since only the most abstract of nonmetric, topological invariants specify the same object or a member of an equivalence class of objects in spite of growth transformations, qualitative experience has a distinct intellectual component. Because functional invariant structures can be described in terms of mathematical equations, the pragmatic concept of truth as ideas that work might meet more traditional concepts of truth as idea-object correspondence relations on mutually agreeable terms.

Higher order invariants specify a style of transformation that is the basis of identifying an organism at every stage of growth. Shaw and Pittenger (1977) explain that every

> growth process has a "viscal" as well as "elastic" one [component]; the viscal component of the transformation preserves the structural invariants that specify species, race, sex, and individual identity while the elastic component expresses the transformational invariant by which the style of change due to growth can be distinguished from other types of change (displacement, size changes etc.). Possessing both of these necessary qualities, the cardioidal strain transformation is a prime candidate for a geometry of growth space of human faces. (p. 129)

Cardioidal strain transformations are, perhaps, most easily seen in the growth style of kidney beans, tomatoes, pumpkins, or acorn squash (though perhaps not in all varieties except those of the kidney bean). The cardioidal strain transformation pertains primarily to the growth of the human head whereby the neck is analogous to the stem of a bean. Individual identity of a person *can* be specified by the "shape of the head alone" (p. 127). Cardioidal strain transformations describe a "higher order form of invariant information picked up over time" (p. 129). The "information for perceived aging or growth may be very abstract indeed" (p. 127). Precisely how abstract is such information?

> We suspect that it is so abstract as to be essentially independent of the absolute features of a single face viewed over time, or of those features common to all faces, or even of those features common to all animate objects that grow. (p. 129)

Perceptual information "*for age level is both abstract and global*" (p. 129) And "roughly speaking, the concept of shape as specified in those weaker geometries are based on *qualitative* rather than *quantitative* properties of objects" (p. 130, italics added). The most concrete invariants belong to the geometry of the most abstract space, whereas the most abstract invariants belong to the geometry of the most concrete or qualitative space. As Descartes tried to show, knowledge is based on perception of what cannot be pictured in the imagination. Contrary to Cartesian epistemological ideals, the highest order abstractions are embedded in concrete or qualitative experience. True intellectual autonomy cannot be coherently conceived in terms of escaping the influences of qualitative experience. Objectivity is not a function of limited simplicity of form but of unlimited and lawfully structured variability and complexity.

Now let us review some of the key ideas and principles of the ecological reconceptualization of perception. The ecological approach recognizes the multitude of incoherent implications that follow from traditional associationistic, representation-comparing, or storage retrieval concepts of mind. This chapter evaluates some of them. Instead of conceiving of change and nonchange as a function of epistemologically distinct, mutually exclusive, and incompatible orders of existence, the ecological approach conceptualizes change and nonchange as epistemologically complementary. Change or variability is the condition that makes the detection of invariance possible. The many variations or changes of the world of experience are reconceptualized as coherent or as coherently structured. This eliminates the need for psychological representations and the paradoxical or incoherent implications of corrective construction processes. Gibson (1979) says that "If a change in the optic array is already coherent, its elements do not have to be made coherent" (p. 187). Exploratory movement or action is the ecological and common-sense way of eliminating ambiguity in perception of the objects of qualitative experience. Orthodox concepts of mind, however, frame visual perception in terms of stationary and passively receptive observation. "*The classical puzzles that arise with this kind of vision are resolved by recognizing that the invariants are weaker and the ambiguities stronger when the point of observation is motionless*" (p. 303). Orthodox theory also creates problems by conceptualizing perception as reducible to consciousness of specific sensory qualities. This idea in principle confines perception to consciousness of inner representations of sensory nerve states. The skeptical implication is that "because we can never know the external causes of our sensations, we cannot know the outer world. . . . [W]e must deduce the causes of our sensations because we cannot detect them" (p. 246). The ecological solution is to use the senses actively and systematically. "The inputs of the special senses have the qualities of the receptors being stimulated, whereas the achievements of the perceptual systems are specific to the

qualities of the world" (p. 246). The general claim is that action makes perception or the direct detection of invariants possible.

According to Gibson (1979), action or "behavior is regular without being regulated. The question is how this can be" (p. 225). This question is the general theme for the remainder of this chapter. In other words, how does perception make controlled action possible without causing or determining it in an involuntary manner? Behavior or action is not governed by "laws enforced by authority or decisions made by a commander but are "controlled" by environmentally based and functionally specific information and by "seeing oneself in the world. Control lies in the animal-environment system" (p. 225). Being information based, in the ecological sense, the rules for control of action are non-propositional. What controls action is detected in the largely changing properties of optical stimulation or lower order forms of invariant information that specify where one is (here) and where one is going (there) with respect to supporting environmental surfaces and in the largely nonchanging properties of optical stimulation or higher order forms of invariant information that specify the desired goal or function of action. The information is the same for all modes of locomotion. "This means that the rules for locomotion will be the same for crawling on all fours, walking, running, or driving an automobile. The particular muscles involved do not matter" (p. 233). For example, the "patchwork of the visual field deforms, in particular, flows outward from a center when I move in the direction of that center" (p. 207). Of course, "the phenomenal surfaces of the world are always perfectly rigid" (p. 207). The same goal can be achieved by an unlimited number of different or unique individual movement patterns.

An unlimited number of distinct movement patterns implies an unlimited variety of distinct forms of organization or distinct and functionally specific muscle groupings. Gibson (1966) explains that "*just as perceptions do not depend on specific sensations, so motor actions do not depend on specific muscles*" (p. 57, italics added). The precise organization of a functional group of muscles is determined by the goal of a pattern of

movement and the pattern of movement itself. A sufficient change in the movement pattern requires a change of organization or functional grouping of muscles. Ecological psychology conceives of action in terms of a goal-directed and *self*-organizing action-system that is able to control an unlimited variety of distinct and functionally specific movement patterns, whereas orthodox theory conceptualizes action in terms of an *other*-organized motor system that operates according to a limited range of mechanically specified movement patterns.

For motor systems the components or essential units of action are simple, episodic or momentary responses or reflexes that are reducible to the operation of specific muscle pairs or simple muscle groups. This reductive relation is thought to be permanent and inflexible. Actions are hence reduced to the operation of mechanically or anatomically specific muscle pairs that are by themselves meaningless and non-functional. Actual movement patterns are analogous to that of a door hinge. Any variation of movement beyond the pre-specified range implies some kind of breakdown or failure. Meaningful animate movement, however, is not limited in this way. Since Reed (1982) frames the operation of such components in terms of "*mechanisms*" such as "tropisms," "reflexes," and "central pattern generators," an automatic and involuntary, physiological kind of reaction is implied (p. 116, italics added). Because control and meaning are extra-systematic, behavior or action is said to be "regulated"(Gibson, 1979, p. 225). A motor system, unlike a living body which is always active to some degree, is inactive until activated and operated by an intelligent operator.

An agent, from outside the motor system, either can operate with unqualified autonomy (rationalist) or is wholly determined by causes external to the body (empiricist). Either way, an agent supposedly operates its own body as a machine that is wholly other than its essentially mental or psychological self. The body is reduced to an unintelligent, self-propelled mechanical system for locomotion and object manipulation that is controlled by an extra-systematic intelligence. As Descartes (1641) argues, the

mind or ego is an unextended, thinking thing, whereas the body is an extended, unthinking thing. Ontologically though not functionally, the two are supposed to be mutually exclusive. According to Reed (1996) modern neurophysiological theory has unreflectively adopted reductive concepts of mind and body. Reed (1996) says that the

> problem with theories of neural function based on the assumptions of mechanical specificity is not with their neurophysiology but with their *psychology*. Outdated and false psychological theories masquerade as up-to-date neurophysiology and buttress the widespread assumption of mechanical specificity. . . . It goes against standard ways of thinking to point out that most neuroscientific research stems from a small set of *psychological* assumptions. Yet this is undeniably the case. Consult any neurophysiological textbook or journal, and there you will find a modern version of association psychology. (p. 70)

The central nervous system (CNS) is supposed to be operated by sequentially patterned neural impulses generated by an executive center, system, or subsystem. The dichotomy between mind and body is implied in the dualism of sensory input or inflow and motor output or outflow. The executive center associates or learns to associate specific input signals with specific motor output signals and issues commands to lower or peripheral centers accordingly. A unidirectional flow of sensory input from the periphery to the center, a unidirectional flow of motor output that flows from the center to the periphery, and the supposition that all signals or impulses begin or end in the center imply a fundamental discontinuity between sensation (thinking) and motor (bodily) activity. Outflowing impulses are unequivocal commands or instructions that are unambiguously and thoughtlessly obeyed by the periphery of the system. The thinking instructor and unthinking instrument further mirror the mind-body dichotomy. Because the roles are permanently fixed, the concept of a hierarchically ordered reduction of mental and physical functions to specific anatomical structures is implied. A fixed set of neural functions form the executive center (traditionally the intellect, ego, mind, or self) and are supposed to reside in some fixed location within but independent of the larger system.

For action systems, Reed (1982) explains, "movements" and "postures" are the "components of actions" (p. 118). Control of patterns of movements emerges from within and throughout the environmentally informed, goal-directed action system. Action systems are conceived as self-organizing. Actions are not a function of mechanically specific component mechanisms, but are "*realizations of affordances by agents*" (p. 124). Both actions and the components of actions are "specific modes of resource use" (p. 116). Components are individually meaningful. For a motor system, actions are constructed from sensory stimuli that over time are associated with motor responses. "Note the assumption that responses do *not* recede from the proximal stimulus" (p. 111). The key point is that an organ or instrument of unimpeded action must recede into focal disappearance. But the "primary integrative function of the nervous system," Reed says, "is to produce behavior in which there is a *recession from the (proximal) stimulus*. . . . [O]rganisms do not respond to stimuli at their receptors, but to objects and events in their environment" (p. 107). Action is controlled by environmentally and functionally specific information. Episodic reflexes or responses "do not appear in normal functioning" or almost never "appear in any pure form" (p. 117). Note that episodic responses or muscle responses such as tics, spasms, twitches, or other involuntary movements are typically problematic or pathological. Such malfunctions or problematic modes of bodily appearance disrupt intentionality and impede goal-directed action.

An action system, in Turvey's (1977) account, is conceptualized in terms of goal-directed, perceptually controlled coordinated movement. Turvey (1990) defines "*coordination as the problem of mastering the very many degrees of freedom involved in a particular movement--of reducing the number of independent variables to the controlled*" (p. 938). Coordination is the "organization of the control of the motor apparatus" (p. 939). As one learns a pattern of coordinated movement, there is progression from a relatively complicated, inefficient, intermittently hesitant, and, perhaps, clumsy pattern of movement requiring conscious intervention to a relatively

simplified, efficient, continuously flowing, and, perhaps, dexterous pattern of movement requiring little or no conscious attention to the movement itself. The body is largely absent from awareness as attention is goal-directed. As a habit is developed or formed, an action or movement pattern becomes self-organizing. We do not have to think about it much--if at all. Turvey shows "*how a device of very many independent variables might be regulated without ascribing excessive responsibility to an executive subsystem*" (p. 938). Insofar as a particular pattern of movement is coordinated, responsibility for control is distributed throughout the system. For Turvey (1977), the "kernel notion" of the action system concept is the

> idea of building acts through a fitting together of relatively autonomous units. This principle of operation reflects the fundamental argument that there are far too many degrees of freedom in coordinated activity for it to be controlled by a single procedure in a single instant. (p. 257)

And initial abstract action plan is progressively realized in concrete detail as a pattern of movement evolves over time. As coordination develops, details increasingly become the autonomous responsibility of the lower levels of the system. *If this concept of control is correct, the Cartesian, top-down ideal of control is false.* The operations of the mind and body form an inseparable dual unity. The body is quite unlike a machine. As a machine acquires degrees of freedom in its movement, it, typically, is wearing out. But learning a particular kind of movement requires only non-functional degrees of freedom to be mastered or eliminated. Learning implies improved functioning, whereas long-term recurring use does not generally improve machine functioning. And, of course, in contrast to a machine, an animal can learn to achieve the same goal through an unlimited quantity of anatomically distinct but functionally equivalent movement patterns as well as learn how to detect the same object in spite of unlimited variation. Constancy for both can be conceived in terms of "groups of transformations" united by the same highly abstract, "clearly nonmetrical" "topological" invariant (p. 257). Perceptual attunement and thus perceiving goals of action are a function of topological or higher order

invariants, while the tuning or adjustment of action structures is a function of lower order invariants and changing stimulation. Turvey elaborates extensively upon the basis of change and nonchange and the interplay between the two.

Constructing objects or achieving goals through goal-directed actions and identifying objects or achievement of goals through perceptual activity both depend upon the changing and non-changing properties of stimulation. From the performance or observation of a limited sample of a specific kind of action or object of perception we are able to construct or identify an unlimited quantity of variations of the same kinds of actions and objects. Turvey (1977) explains that although neither the quantity of possible variations nor the precise organization of a particular variation can be known in advance of action, there is a "constancy function" in action and perception that "indicates" a "competency that exceeds prior learning," a competency that "vastly outstrips our experience with" a limited sample of actions and objects (p. 213). We are able to produce and identify an unlimited number of variations of the actions and objects of past experience based both on past experience and information provided by the current context of experience. Recall that orthodox concepts suppose that *past* experience is the exclusive source of constancy whereas ecological theorists argue that *current* experience is an undeniably self-sufficient and essential source of constancy. For the ecological approach, there is a functional equivalence common to all the variations of the same act or object and a common information that unites action and perception.

With respect to the constancy function in perception, Turvey (1977) says that "a visually presented capital letter A can occur in various sizes and orientations and a staggering variety of individual scripts. Yet in face of all this variation, the identification of the letter remains, for all intents and purposes, unaffected" (p. 212). The same principle applies both to identification or recognition of objects (perception) and production or construction of objects (action). Turvey says that

> the phenomenon of constancy is not limited to the domain of perception, but is equally a characteristic of action. Thus the letter A may be written without moving any joints or muscles other than the fingers. Or it may be written through large movements of the whole arm with the muscles of the fingers serving only to grasp the writing instrument. Or, more radically, one can write the character without involving the muscles and joints of either arms or fingers, by clenching the writing instrument between one's teeth or toes. It is evident that a required result can be obtained by an indefinitely large class of movement patterns. (p. 213).

Goal-directed action is not specified mechanically or anatomically but is functionally specific. That is to say, perception of what lies wholly beyond the sensorimotor surface serves to guide or control action. A key question is *how*, that is, by what processes, mechanisms, or structures, are indefinitely large classes or sets of variable objects and actions constructed and known as members of the same class or set. Put differently, the question is about how invariance is detected among indefinitely large classes of things or movement patterns in which no two objects or actions are identical.

Traditional epistemologically based explanations polarize the issue but clearly imply common problems that begin with a distrust of *present* experience. On the one hand, rationalist concepts of mind presuppose that innate ideas (and native principles of association) truthfully organize otherwise vague and ambiguous objects of sensory experience. On the other hand, empiricist concepts of mind assume that sensation-based ideas stored in memory (also organized according to innate principles of association) are retrieved in order to correct and enrich otherwise poorly or inadequately structured sensation-based perceptions of the present moment. Either way psychological construction processes are solely responsible for reducing the massive ambiguity or variability of the objects of experience to univocal invariant properties. Both approaches incorporate two principal dichotomies that frequently receive little or no criticism. First, visual perception is assumed to be functionally independent of movement (locomotion, motility, goal-directed or exploratory action). Second, variability and constancy in perception are supposed to be functionally and ontologically distinct. Traditionally, the

distinction has been reduced to mutually exclusive terms such as appearance or reality, subjectivity or objectivity, opinion or knowledge, mind or matter, mental or physical, mind or body, and quantitative or qualitative. Insofar as motion and perception and variability and constancy are assumed to be mutually exclusive, experience and the objects of experience are denied a significant role in any concept of objective cognition. Context thereby loses its power to constrain hypothesis formation and testing.

When constancy in perception and action is conceived exclusively in terms of psychological construction processes, reliable control of action requires the mind to represent every possible state of the world and every possible pattern of movement from the beginning to the end of an act. In other words, every possible variation of the complete evolution of the act and its context must be known in advance of the act. Otherwise unpredicted or unexpected variations in either the performance itself or its context could impede or even paralyze the flow of activity. Consequential performances would be referred to as uncoordinated, unskilled, clumsy, or otherwise incompetent. The successful and reliable pursuit of goal-directed action--especially over the long term--implies that the future is already encoded in an initial action plan or present state of the system. Turvey (1977) asks,

> How can these indefinitely large classes of possible movement patterns be stored in memory? The answer is that they are not. Clearly, I do not have on record in memory all possible temporal sequences of all possible configurations of muscle motions that write A; indeed, I have yet to perform them and by all accounts I never will. The essential question about our A writing task, therefore, can be stated more fundamentally: How can I produce indefinitely various instantiations of A without *previous* experience of them? (p. 213, italics added)

Remember that neither rationalist nor empiricist concepts of mind trust *present* experience and objects of *present* experience enough to believe that it can support constancy in perception and action.

Turvey (1977) conceptualizes the exclusively top-down or center-outward model of executive control of action in terms of the "piano or push-button metaphor" (p. 215). Turvey says that in "this metaphor muscles are represented cortically in keyboard fashion, one muscle per key, and central impulses to the muscles are held to be unequivocally related to movement. The essence of this view is that the executive instructs each muscle individually" (p. 216). But because of the "ubiquity of reciprocal innervation" alone, Turvey questions the value of the metaphor. The lower or peripheral centers of the CNS regularly exhibit a lateral exchange of "innervational impulses" and therefore communication and control among lower or outer centers regularly bypasses the executive or any higher center (p. 216). That is to say, the "*parts*" of the system "*cooperate through some kind of mutual understanding in achieving a common goal*" (Turvey, 1990, p. 939). "The intricate and extensive interrelation among muscles makes it both arduous and wasteful to instruct them singly" (Turvey, 1977, p. 216). *The basic thesis is that "there cannot be an invariant relation between innervation impulses [centrally generated] and the movements they evoke"* (p. 216, italics added).

Based on the implications of experimental research in neurophysiology Turvey presents three fundamental criticisms of the keyboard concept of motor control. First, "the relationship existing between impulses to muscles and the movements of a single limb segment is equivocal: the same impulses may produce different movements and different impulses the same movement" (p. 216). Second, we are asked to imagine a simple experiment and its implications. Suppose that

> the same rythmical motion is traced out with a hand holding on separate occasions (1) a hammer, (2) a baton, and (3) a can of beer. The function relating the changes in the external force field to time will differ in each instance even though the pattern of rhythmical movement is unchanged. In each of these three instances a different mapping would be required from the function generated by the external force field to the desired function specifying the rythmical pattern. . . . *[T]he sequence of impulses to the muscle "cannot even maintain a remote correspondence" to the factual form of the movement.* (p. 217, italics added)

The desired goal of the action or specific pattern of rhythmic movement remains constant even though the object is varied. The configuration of each object is different and the weight may also vary. Different weights change the quantity of force and therefore the effort or strength required, while different configurations alter the quality of coordinative effort required to competently wield the object. The goal, an abstraction that originates in the executive center, is progressively realized in concrete detail through the temporally conditioned evolution of the act. *The sequence or pattern of neural impulses generated by the executive are transformed into patterns that are neither known by nor predictable by the executive. Although lower level instructions and procedures are clearly not reducible to higher level instructions, the function or intention of the executive center is preserved.* Turvey suggests that since the executive is not responsible for "instructing individual muscles" and is "ignorant of the current, precise details of the external force field," "executive instructions are not written in a form relevant to that field" (p. 217). And since "in the course of performing a coordinated pattern of movement the executive system does not control muscles singly" and since "peripheral details" would be "irrelevant," it "need not be apprised" of "such information" (p. 217). Because the executive may be ignorant of "changes in local conditions," a "movement of a limb" may be "indifferent to central influences" (p. 216). The lower levels of the system make adjustments relatively autonomously and automatically.

Now, a "third criticism of the push-button metaphor is if the executive behaved in the fashion suggested, instructing each muscle individually, then it would be called upon to manage the enormous number of degrees of freedom that the motor apparatus attains" (p. 217). Turvey argues that the lower centers or systems operate in a "relatively autonomous" manner so that given the unlimited range of movement patterns possible for an animate organism, the lower centers demonstrate a higher degree of control than does the executive. This, Turvey proposes, can be established as a "fundamental principle" by means of experimental evidence. "A homely example illustrates the point: try writing a

letter, for example, *W*, while simultaneously making circular motions with the foot" (p. 217). Another example, based on more sophisticated research, demonstrates that

> when one makes movements of different rhythms simultaneously with two hands, the amplitude of the movements performed by one of the hands is modulated by the frequency of the movements performed by the other. Thus it is not difficult to demonstrate the number of degrees of freedom of the executive is very small; on the push-button metaphor it would have to be very large. We can conclude, therefore, on three counts, that the executive does not, or indeed cannot, control individually each motor unit or even each muscle participating in a complex act. (p. 217)

The "fundamental principle," Turvey says, is that "the number of degrees of freedom of the system controlling action is much less than the number of mechanical degrees of freedom of the controlled system" (p. 217). The controlled system regulates its own movement to a greater extent than the executive does.

The responsibility of the executive center is not to control individual muscles or motor units (details) but to "control the modes of interaction of lower centers" (Turvey, 1977, p. 218). Turvey explains that

> the element entering into the design of an act is typically not an individual muscle but a group of muscles functioning cooperatively together. We have good reason to speculate that the reflexes may well comprise the 'basis' of the set of all such functional groupings and hence of the infinitely large set of all acts. . . . Essentially, a 'basis' contains the minimum number of elements that are required to generate all members of a set. (p. 219)

What the executive controls are functional groups of muscles. "A basis of a subset of a set of elements which when acted upon by suitable operations generates the entire set of elements" (p. 220). A reduction in the executive

> burden of control is achieved ontogenetically through the gathering together of reflexes into larger functional units. . . . We will refer to reflexes and functional combinations of reflexes as 'coordinative structures.' . . . Of cardinal importance . . . is the assumption that a closely knit functional combination of reflexes performs as a relatively autonomous unit; by this assumption, relative autonomy is a fundamental property of coordinative structures, at any level of complexity. (p. 220)

A coordinative structure, as Turvey (1990) further defines it, is a "group of muscles spanning several different joints" that is constructed from muscles that otherwise are "capable of contracting independently of each other" yet "can be functionally linked so as to behave as a single task-specific unit" (p. 940). "Such linkages may comprise the most primitive independently governable actuators of movement. They are characterized by a pronounced standardization that lessens the degrees of freedom requiring executive control" (p. 940). From the phenomenological perspective, the formation of a habit lessens the need for conscious attention to assembly and control of a coordinated activity.

We must therefore suppose a "repertoire" of executive "operations that modify and relate the coordinative structures so as to produce any and all acts. Thus, we may conjecture that the elements entering into an action concept are the operations defined over the set of coordinative structures" (p. 220). Consequently, "acts are produced by fitting together structures each of which deals relatively autonomously with a limited aspect of the [motor] problem" (p. 221) whereby "walking and running can be attributed to a relatively simple executive instruction which sets into motion the entire segmental apparatus and which, in itself, is deficient in information about the actual strategic order of necessary muscle contractions" (p. 219). Insofar as the control of action is decentralized, the executive is relieved of the formidable epistemological burden of representing every possible pattern of movement and every corresponding environmental contingency as well as the paradoxical implications of the storage-retrieval problem. Although the "action plan is stated crudely "in three-dimensional kinematic language," the "actual pattern of motion is precise in displacement, speed, and time of occurrence" (p. 221).

The push-button metaphor and corresponding motor system concept together imply hierarchical principles of CNS operation, whereas the action-system concept proposed by Turvey is based on heterarchical principles of CNS operation. Turvey (1977) explains,

> By a hierarchy we understand an executive at the highest level of a decision tree makes the important decisions and spells out the fundamental goals. Decisions on the details are left to the immediately subordinate structures which in turn leave decisions that they cannot make, for whatever reason, to even lower structures. The general strategy is repeated until the final remaining decisions are made by the lowest structures on the decision tree. (p. 221)

The scope of decisions and consequential procedures at lower levels is determined by higher level instructions; there is a one-way flow of information and responsibility from higher to lower levels. Nothing gets to the lower levels without first going through the top. Turvey explains,

> The crucial property of a substructure in a hierarchy is that in the perspective of the higher level it is a dependent part, but in the perspective of the lower level it is an autonomous whole. . . . We may question, however, the notion explicit in the concept of a hierarchy that the *direction* of the whole-part personality of substructures is immutable. (p. 221)

Insofar as we suppose that neurophysiological organization is reducible to anatomical structures or is mechanically specified, "certain structures may appear dependent parts of other structures, and a compelling argument may well be made for the immutability of this relation in the peripheral reaches of the neural mechanisms supporting action and perception" (p. 221). But from the goal-directed or functional perspective that emphasizes "'knowledge' structures rather than anatomical structures the relation between any two structures need not be fixed; either may treat the other as relatum or subprocedure, depending on the problem to be solved at a given moment" (p. 221). The "commutability" of "subordinate" or "lower" and "executive" or "higher" functions is a key feature of a system referred to as an action "heterarchy" or "coalition" (p. 221). The "partitioning" of functions into either "agents" or "instruments" is not fixed or static (p. 222). Environmental information, while bypassing higher levels, can enter and function within the system at lower or peripheral levels; knowledge and agency are therefore distributed flexibly to many levels. With the heterarchical interpretation of action control,

"management of the action system would not be the prerogative of any one structure; many structures would function cooperatively in the framing of action plans and desired consequences, although not all structures need participate in all decisions" (p. 222). Partitioning or organization is determined by the current goal-directed function rather than fixed anatomical structures. Turvey explains that the "task of the action coalition/heterarchy" is "that of translating an abstract projection of the environment onto joint-muscle schemata" (p. 229).

According to Turvey (1977), the "role of the executive" is to "modify the mode of interaction among elements at a lower level" (p. 226). Any subsystem or set of subsystems functioning as the executive is "not a single neuroanatomical structure but a set of procedures engaging a number of neuroanatomical structures" (p. 226). Turvey (1990) says that

> In a biological movement system with its distributed control, any subsystem (or set of subsystems) in the executive role will not know the actual outputs of the subordinate subsystems from which it composes an act. . . . [T]he subsystem activated by the executive might not be the actual subsystem that does the job. Different subsystems can satisfy a piece of executively specified function and will be interconverted by low-level automatic *processes according to a local expediency of which subsystem will get the job done most simply*. Executive knowledge is, therefore, only approximate. (p. 940, italics added)

Executive knowledge and control is generally confined to "broad classes of realizations" (Turvey, 1977, p. 226). Turvey argues that the "smallest unit of information available to an executive are probably not functions but families of functions" (p. 240). Generally, the executive can specify nothing more specific then an "equivalence class of functions" (p. 240). "Roughly speaking the equivalence classes serve as ballparks into which it is sufficient for the executive to transfer the state: once the state enters the ballpark it will be automatically brought to the correct position without further attention" (p. 227). "For the system two states are defined as equivalent if they differ by a transformation realizable by the system" (p. 226).

Executive procedures determine equivalence class specifications, and low-level subsystems subsequently make remaining specifications within equivalence classes. Turvey (1977) proposes that

> the interconverting of states or functions is characteristic of low-level systems, so that a state or function specified by the executive (as for that matter any higher domain) may be substituted for by one from the same equivalence class but one which is more attuned to current conditions operating within and around the system and to the system's privileged knowledge of the capabilities of other low-level structures. Similarly, executively specified functions determining the switching from one structure to another form another "ball-park," and low-level systems may autonomously interconvert transition functions of the same equivalence class as the need arises. By this reasoning the units of information that behave deterministically are not functions but equivalence classes of functions. (p. 226)

The initial action plan is thus represented in the "highest domain" as "a specification of a subset of large coordinative structures that almost fit what is intended" (p. 228). Equivalence classes operate as "invariant units of information" for control of action. Executive ignorance about the precise specification of the next stage of the act's evolution or the precise outcome of the next lower level procedure "implies a high degree of uncertainty in executive commands" (p. 227). Because executive specification is confined to "an unknown member of a family of possible functions or states," a "high degree of uncertainty" is a characteristic of executive commands (p. 227). Although executive instructions are not "those actually carried out by the instructed system," they will be "judged" by the executive as "satisfactory" (or not) based on the functional success of the evolving act. The "serial nature of the act is said to arise not from the extemporaneous linking of component motions but rather from the differentiation of an already formed plan" (p. 228). The actualization or differentiation of the abstract action plan is both its initial adjustment to the particulars of pre-existing conditions and its progressive adjustment to new particulars disclosed during subsequent cycles of locomotion. Both kinds of adjustments are controlled by lower systems in conformity

with executive intent and proceed according to functionally relevant propriospecific (self-specifying) and exterospecific (other specifying) information that is integrated into the system at the lower levels.

Since ambiguities and errors are "propagated through the action system during the act's evolution" the question arises of "how a configuration of motion is coordinated with precision and finesse" (Turvey, 1977, p. 227). A precise and unambiguous pattern of movement can be achieved in spite of executive ambiguity and ignorance.

> The realization of an action plan as a coordinated pattern of motions requires its translation from the crude language of coordinative structures to the precise language of muscles. . . . The central question now is how can alphamotorneurons specify to muscles the needed lengths and tensions when these terms, length and tension, are not in the lexicons of higher domains and hence, by definition, cannot be ingredients in the action recipe. (p. 230)

Because muscle "length and tension" are understood only in lower domains, Turvey's answer begins lower in the system with the operations of coordinative structures and the spinal cord. Turvey (1977) says that "in the main, coordinative structures have their origins in the spatially divided and relatively autonomous subsystems of the spinal cord" (p. 230).

At this stage of the discussion, Turvey introduces a slight revision of terms. Earlier the "role of the higher levels of the nervous system" was "to pattern the interactions within and among coordinative structures," but now it is "to modulate interactions within and among neural mechanisms at the spinal level" (p. 230). The general focus is shifted from the principles of an action heterarchy and the functional organization of information and agency to the functional, information-controlled organization of spinal structures. The spinal cord is conceptualized as a "biasable" "system of segmental interactions" (p. 233). The

> system of segmental interactions is biasable and as a general strategy the activating of coordinate structures occurs against a background of spinal mechanisms already prejudiced toward executive intentions. Thus it may

> be argued that the control of movement is in many respects the reorganization or *tuning* of the system of segmental interactions and that this attunement precedes the activating instructions to coordinative structures. (p. 233)

The executive activates classes of tunings or equivalence classes of functions, whereas the tuning or readiness of coordinative structures for the intended act is antecedently determined at the lower levels of the action system. In other words, the organization of the coordinative structure is such that they are disposed to satisfy executive intent.

The spinal cord plays a sophisticated and intelligent role in coordinated activity. Turvey's (1977) conceptualization of the segmental apparatus helps us to understand what is meant by embodied intelligence.

> The segmental apparatus of the spinal cord is a functional entity well suited to the organization of coordinated activity. Its component structures are richly interconnected by a variety of horizontal and vertical linkages, providing an intrinsic system of complex interactions which is *no less essential for the evolving act than supraspinal influences*. (p. 231, italics added)

The segmental apparatus exhibits the heterarchical form of organization described above. Agency and information operate at every level of the action system. The spinal cord is not passive conduit for the transmission of information and commands. "The spinal cord is an active apparatus that does not passively reproduce instructions from above" and "indeed, may regulate its degree of subordination to supraspinal mechanisms" (p. 231). The biasing of the system or segmental system of interactions according to executive intent exemplifies the lower system's privileged knowledge and responsibility for particulars. The abstract plan is thereby differentiated into functionally specific particulars. The results of neurophysiological experiments, Turvey (1977) says,

> suggest that a profound reorganization of the spinal cord precedes movement. . . . It is evident . . . that in the differentiation of an action plan the realization of instructions to coordinative structures is determined by the state of these structures on receipt of instructions. . . . Since the argument is that coordinative structures when activated perform in a *relatively autonomous* fashion, it follows that the *details of their*

> *performance are very much determined by the state of the segmental apparatus at the time of activation.* (p. 239, italics added)

Reorganization or tuning is what, during the initiation and evolution of the act, progressively transforms the abstract plan into actual or concrete detail.

Let us now examine some of the empirical or experimental origins of the concept of tuning. Based on the implications of experimental, physiological research, Turvey (1977) shows that a "joint-muscle system" behaves like a "mass-spring system" (p. 243). The self-organizing character of an action system is partly a function of natural or physical law. Tuning of coordinative structures or functional muscle groups is analogous to spring "parameter specification" (p. 239). Turvey (1990) begins with experiments that evaluate the physics of individual limb movements.

> Ballistic limb movements (e.g., an arm rotating by its own momentum) are put to considerable use. Such movements can be achieved by setting the muscle linkage to behave like a spring whose equilibrium position is the intended limb position. This spring-like organization simplifies control. To set the spring, one needs only to know the final position; knowledge of the initial position is not needed. (p. 940)

A simple mass-spring system is controllable to the extent the parameters of spring stiffness or load capacity and unloaded length are adjustable. Tuning is the adjustment of such parameters. Turvey says that "the problem of controlling a joint-muscle system reduces to that of fixing certain characteristics, that is, of setting mechanical parameters of the muscles, or more precisely, of setting the biases of the fundamental servomechanisms" (p. 240). The initial, executive-produced activation is followed by goal-specific tuning or parameter specification that, optimally, results in a particular cycle of locomotion that requires no executive intervention before it is complete. For example, when we climb a set of stairs in a fully coordinated manner, each ascending footstep is adjusted to the appropriate height or equilibrium position. If an individual footstep is too high or too low, we begin to trip and fall unless executive intervention is successful. This becomes more obvious when climbing stairs with individual risers that

are higher or lower than is customary. The same can be said for reaching or any other cycle of locomotion. Executive control is simplified because once a spring parameter is set or tuned, the mechanism finds its own equilibrium position or goal state, i.e., a particular step height. Because a goal-directed cycle of locomotion is controlled by information that specifies the goal-state but not the initial position of a limb, the from-to structure of goal-directed action is evident even at the level of individual locomotor cycles.

Turvey (1977) explains that the operation of "integrating reflexes," the organizational basis of coordinative structures, uses processes that control muscle contraction or servomechanisms (p. 231).

> The integrity of the spinal cord rests on the fundamental servoprocess manifest in the alpha-gamma link regulating muscle contraction. Upon this servoprocess are built the intra- and intersegmental reflexes. We suppose that the modus operandi for integrating reflexes (the basis of coordinative structures) in coordinated action exploits rather than disrupts this fundamental servomechanism. (p. 231)

The precise regulation of muscle contraction and extension forms the last stage of procedure translation in the evolution of an act or the most concrete, precise, and detailed realization of the differentiation of the crudely stated, abstract action plan. The development of "integrating reflexes" ensures a simpler, more fluid cycle of locomotion. Requiring less executive intervention, such movements are less ambiguous or exhibit a more efficiently structured flow of energy. In less technical terms, a habit is formed. Turvey argues it

> would seem . . . that a joint-muscle system does behave like a spring, that is like a vibratory system, and that action structures [or coordinative structures] can choose parameters for this "spring" [or tune this spring] in accordance with prevailing conditions. (p. 242)

The subordinate subsystems or coordinative structures are *self-regulating*, and according to the mechanical analogy, action structures themselves choose spring parameters that are best suited to executive intent and local conditions.

Turvey (1977) describes the operation of coordinative structures in terms of information structures. Action structures mirror information structures in the heterarchical form of organization. The two form a functional dual-unity. Turvey explains that

> actions are produced by fitting together substructures, each of which deals relatively autonomously with a limited aspect of the action problem. In addition we recall that each domain may be constructed as a representation in which relations are defined on a set of autonomous structures *with the size of these structures becoming progressively smaller and their number progressively larger as the action plan is mapped onto progressively less abstract representations*. We now hypothesize that into each representation tuning functions enter as modulators of coordinative structures. (p. 240, italics added)

Based on the implications of the preceding arguments, Turvey proposes that "it would be logical for us to identify the entities in a representation with coordinative structures" (p. 223). Although functionally determined muscle lengths and tensions are specified in the representation, nothing of the desired goal is represented.

Static and dynamic parameters are autonomously specified or tuned at every level of the action heterarchy. Static parameters are most closely related to posture, while dynamic parameters are most closely related to coordinated movement. Functionally, the two are inseparable. We may now, Turvey (1977) writes, "envisage the set of fundamental servomechanisms" in the process of "regulating joint flexion and extension as collected together into a single vibratory system for which 'static' and 'dynamic' parameters can be specified" (p. 243). Persistence or constancy and change or variability are evident in perception and objects of perception as well as actions and objects of action. "Choice of static parameters for the system determine the aim of the movement (the final steady state) independently of initial conditions; choice of the dynamic parameters determines (to a large extent) the rate and acceleration of the movement and also its form (aperiodic, oscillatory, etc.)" (p. 243). In phenomenological terms, the evolution of a successfully executed goal-directed, coordinated action discloses a

functionally defined balance of static presence and dynamic change. The two form a dual-unity essential for a functional action system.

> In such a system the setting of the parameter *s* defines the "stiffness" of the system and thus its equilibrium state, and the setting of the parameter *k* defines the friction or damping constant which determines the rate at which the system achieves equilibrium and the form of its behavior, that is whether it oscillates or not. By way of summary, we have seen that the functional tuning of the segmental apparatus of the spinal cord may be likened to the specification of the parameters *s* and *k* for vibratory systems. On the assumption that all coordinative structures behave as vibratory systems, then tuning as a parameter specification emerges as a viable procedure for the behavior of selected coordinative structures at all levels of abstraction of the action heterarchy. (p. 244)

The "functional tuning of the spinal cord" is analogous to the "specification of parameters *s* and *k*" or static and kinematic parameters "for vibratory systems." The "analogy between systems controlling action and vibratory systems suggests that *we may usefully conceive of coordinative structures in general as biasable, self-regulating vibratory systems*" (p. 243).

The principle of spring-like organization and tuning that Turvey transfers from the operation of individual muscle pairs to the operation of coordinative structures he also transfers to the operation of the whole animate organism, conceived here as a self-organizing action-perception system. Posture is therefore a kind of steady state or equilibrium that emphasizes the specification of static parameters, while movement is a kind of dynamic condition that emphasizes the specification of dynamic parameters. A balanced combination of the two is the basis of coordinated movement. Reed (1982) explains that a "*posture* is an orientation of an animal with respect to its environment. Thus there are proprio- and exterio-ceptive processes in any posture. Most animals have otoliths, statocysts, or other gravity-detecting organs. . . . *Movements* are changes between postures" (p. 118). An animal perceives and acts on a level determined by its own needs and abilities. Gibson (1982) elaborates further. A "fixed posture of the body and its members never persists for long; it gives way to a movement, which is a change

from one posture to another. Even an equilibrium posture like the upright stance consists of small corrective movements" (p. 389). Posture and movement therefore form a kind of functional dual-unity. Reed (1982) says that "movements are changes between postures. However, animals usually maintain some orientation while moving" (p. 118).

> Maintenance of posture is more than just holding a single balanced position; there are also *dynamic postures* which must remain *invariant* during other activities. For example, almost all animal locomotion presupposes a dynamic posture oriented to gravity. Postures, and movements that are transitions between postures, are the basic units of action. (p. 114, italics added)

An animate organism is never completely at rest or inactive. Varying proportions of persistence and change are essential elements of coordinated movements such as locomotion and object manipulation. So Reed refines his definition.

> Postures are more or less persistent orientations of an animal to its environs. Postures are *nested*, so that the limbs, abdomen, head, etc., may be oriented and re-oriented with respect to each other as well as to surroundings. Any change in posture involves a movement, for example, rotating the head above a stable body. The movements may be nested together, while almost any movement will leave at least some persistent postures. For example, while locomoting, most chordates and arthropods maintain orientation to gravity and keep certain relations among body parts within a prescribed range of variation. (p. 118)

Gibson (1982) says that "any movement entails the altering of a special posture while maintaining a general posture. Thus, walking involves keeping an upright posture; and pointing with the arm involves keeping an upright posture. There is always some non-change underlying the change of posture" (p. 389). As Turvey argues, tuning specifies detailed parameters that constitute the organization of the action system as a whole according to executive intent and local conditions.

Turvey (1977) says that "the elegance of tuning as a control process is that it permits the regulation of an autonomous system without disrupting the system's autonomy" (p. 240). The "mechanisms of tuning and activating coordinative structures are largely separate" (p. 244). Tuning is thus largely a function of lower or peripheral

systems. His basic theory is that "*segmental tuning is not specified in the action plan but is determined by other structures on acknowledgement of the executive's intention*" (p. 245). Tuning and activation are "governed by separate mechanisms." Activation of coordinative structures is an executive determination of an equivalence class of functions that "takes place against a background of prearranged interactions within the segmental apparatus of the spinal cord" (p. 245). Since the "segmental apparatus has been pretuned, or simply tuned," the "detailed performance of coordinative structures is determined by the extant interactive state of the segmental apparatus" (p. 245). The special advantage of such a decentralization of responsibility is that the executive needs only a "standard set of instructions," while the unexpected or even unpredictable details of environmental contingencies are handled by "relatively independent tuning systems" (p. 246). The relatively independent tuning systems spontaneously exhibit a readiness for whatever the executive plan does not or cannot specify; they achieve the goal specific form or "appropriate variant" of spinal organization (p. 246). The executive is relieved of the incredible epistemological burden of representing every possible state of the world and every possible pattern of movement. The future, by definition, is not already given and does not need to be encoded into the present state of an action system or in an initial intent or action plan.

Instincts or drives may be understood as kinds of action plans that operate on a long-term or recurring basis. The initial representation of an action plan is a highly abstract pattern of neural impulses that may be identified with higher order invariants of the environment, "those which specify the identities of objects and their possibilities for transformation" (Turvey, 1977, p. 257). Higher order invariants are conceptualized in terms of highly abstract, "non-metric" or "topological properties" (p. 257). The initial, abstract action plan, with its local condition independent sequence of neural impulses, becomes manifested as "motions finely attuned to the environment's structure" as the detailed content of perception is progressively "interjected into the act during its

evolution" (p. 257). Action plan specifications are standardized patterns that are adjusted to context-specific particulars through environment-sensitive tuning. Such functionally specific patterns are constant and persistent, yet flexible. Repeated or recurring patterns of action may endure over the long term yet may be adapted to a considerable range of environmental changes--without anticipating everything. Turvey says,

> Indeed, the largely invariant species-specific behavior of animals documented in the now celebrated works of ethologists . . . strongly suggest that evolution has thoroughly exploited the principle of *separating action plan specification from tuning*. The instinctive rituals are released by stimulation of a simple kind--the red belly of the stickleback, the spot under the herring gull's beak--but the unfolding stereotypic behavior is flexible: it relates to the lie of the land, to the contingencies of the local environment. *We should suppose that these species-specific action plans are adjusted by the pickup of information about the environment, that is to say, their tuning is environment related.* (p. 246, italics added)

Tuning stands in place of control managed by a vastly complex and paradoxical executive memory system. Because the concept of an action-perception system presupposes the operation of action plans or goal-directed cognitive states and patterns of behavior known as drives or instincts, it implies the continuous operation of motivational states known as emotional intent or desire. Recall Jonas (1966) who explains how the "power of movement" and "distinct powers of emotion" are complementary (p. 101).

The separate operations of action plan specification and tuning is clearly illustrated in locomotion. Turvey (1977) says that

> although locomotion propels an animal through its cluttered, textured environment, the basic locomotion pattern generator is independent of local conditions. . . . The necessary adaptive modifications are effected by feedback from the peripheral motor apparatus (the muscles and joints), from changes in tactual motion, from the basic orienting system . . . And most significantly, from the perceptual pickup of information about surfaces and objects, about the relations among them and the moving animal. Visually detected information about the environment plays a fundamental role in anticipatory changes in the basic locomotion pattern. (p. 246)

Without vision locomotion is quite difficult. "To manipulate the locomotion plan by touch or kinesthetic feedback alone would be unsatisfactory, since this form of regulation would occur after an ill-adjusted movement and thus would specify compensatory changes for states that are no longer current" (p. 246). In less technical terms, locomotion through a cluttered environment without vision will either be very slow and cautious or likely result in frequent collisions and injury. Touch and joint-muscle feedback should be used for "small, final adjustments" (p. 246).

Now let us shift the emphasis to different properties of perceptual information and their role in control of action. Turvey (1977) agrees with Gibson (1966) that the "animal can detect in the changing optical flux those mathematically invariant properties that correspond to the physically constant [and permanent] object or surface and which afford for the organism possibilities for action" (Turvey, 1977, p. 249). Control of locomotion and goal achievement requires the ability to detect and respond to changing and nonchanging properties of stimulation. In other words the animal must be able to perceive and act according to its own purposes and, the (perhaps rapidly) changing requirements of a situation. Turvey (1977) says,

> In directing its locomotion to one object and weaving its way among others, and in pursuing one moving object and fleeing another the animal exhibits its capacity to make discriminative responses. But the responses must be based on different properties of stimulation from those that determine the control of locomotion: they are responses that are specific to the properties of the optic array which do not change as opposed to those which do; importantly, *they are properties of stimulation that do not result from the animal's locomotion.* (p. 248, italics added)

The properties of stimulation that do not change for an animal because of the animal's own locomotion or movement are the higher order forms of perceptual information that specify the identity or use-value of surfaces, objects, or organisms. Such information specifies a positive affordance in the case of pursuit or safety and a negative affordance in the case of avoidance or danger. Turvey explains that

> the animal must be able to detect permanent properties of its environment: it must be able to detect whether a surface affords locomotion and whether a contour with internal texture [a solid object] affords a collision; it must be able to detect whether a moving texture affords eating or whether it affords being eaten. (p. 248)

Inadequate footing could lead to a fatal fall; a careless or inattentive move could result in an injurious or fatal collision; a failed pursuit could lead to frustration or hunger while inadequate evasive movements could result in injury or death. Of course, success or failure depends both on identification of what things afford and control of locomotion.

According to Turvey, the ability to detect nonchange or invariance in the midst of change implies the existence of two functionally distinct but complementary properties of stimulation. Hence, Turvey (1977) says that we should make a

> distinction between those properties of stimulation which *afford* approach, avoidance, pursuit, flight, changes in footfall pattern of gait, and transitions from running to leaping, and those properties of stimulation which *control* locomotion in each of these respects. It would seem that the former are those properties which do not vary over time while the latter are those properties which do. And the pickup of change and nonchange are concurrent perceptual activities. (p. 249, italics added)

While the optic array or perspective structure as a *whole* is frozen for the stationary observer, it flows or transforms as a *whole* for the moving observer. That is to say, the frozen array specifies stationary observation, and the flowing array specifies a moving point of observation. Properties of stimulation that result from locomotion, from the perspective of the self-moving animal, are global and local changes or transformations projected into the optic array. Global or holistic changes are always *essential* for control of locomotion. Depending on the situation or context, localized changes may or may not be essential for control of locomotion. While the optic array or perspective structure as a whole is frozen for the stationary observer, observer independent, localized changes may or may not be projected into the optic array, depending on the movement of other animals and objects. Such objects or organisms, however, might provide motivation for pursuit or

avoidance. Thus, while the whole optic array transforms or flows for the moving animal, other moving organisms or observer-independent objects or surfaces that are projected within the array produce only localized changes.

Localized changes can be seen from an unlimited number of different perspectives by a moving individual observer or viewed simultaneously from several different perspectives by several different observers. Upon each different perspective is projected a different configuration of surfaces and a different transformation of the same object or organism. The same invariant-structure or affordance can be picked up from an unlimited number of different locations. The ground that supports locomotion is usually about one-half the optic array and is usually well specified at every location in an environment. The self is specified and thus known because of goal-directed action that is controlled by perceptual information. Holistic transformations of the optic array that specify and are produced by locomotion always inform its *control* and constitute as well as specify the private or first person perspective, whereas local changes in the array are only partly a function of the private perspective or the perspective of the self-moving animal and may or may not be essential for control of locomotion. This depends on whether projections in the array correspond to objects of pursuit, avoidance, or indifference. Turvey says that "controlling locomotion calls for the detection of change, detection of rates of change, and detection of rates of change in the flowing optic array" (p. 248). Such information is essential for, say, crossing a busy intersection or heavily travelled highway.

Visual control of locomotion, according to Turvey (1977), is adjusted or tuned by "tuning reflexes" (p. 250). Tuning reflexes are fully formed habits. Tuning reflexes intelligently control meaningful units of behavior with relative autonomy. Turvey explains that the

> principal function of tuning reflexes seems to be that of altering the intrinsic system of segmental relations rather than that of initiating

> configurations of motions in components of motor machinery. The impression is that tuning reflexes adjust the bias in the fundamental servomechanisms. (p. 250)

For Turvey, the dynamic relation between visual perception and tuning reflexes in control of locomotion is central for understanding the functional dual-unity of action-perception system operation. Examples of tuning reflexes are the "classically postural or attitudinal . . . reflexes such as the tonic neck reflex, which biases the motor apparatus for movement in the direction of gaze, and the labyrinthine reflexes, which bias the musculature to resist motion on an incline or to resist rotation" (p. 249). Experimental evidence shows that "low-level" tuning results from eye movement. "In the cat, stretching the horizontal eye muscles facilitates a turning of the neck and head from the direction of gaze and stretch of the vertical eye muscles influence the forelimbs" (p. 249). *Properties of visual stimulation are, by means of tuning reflexes, realized as segmental tuning parameters.*

> Movement in a forward direction calls for a particular organization of the basic coordinative structures. If the animal so moving detects an invariant specifying an object or surface in its path that is to be avoided [or pursued], then it must alter the organization of the relevant coordinative structures in order to change direction. But change in direction need not actually require direct executive intervention in the low-level organization of the action plan; a shift in the direction of gaze may be all that is needed. . . . Similarly, if the contoured texture of the optic array afforded jumping on, then *the act of directing the eyes or eyes and head upward would facilitate the transition in segmental organization from that of running to that of jumping.* (p. 251, italics added)

The primary advantage of tuning reflexes is a "reduction in detail required by high-level instructions" (p. 250). Responsibility both for control of action or agency and for the epistemological burden is decentralized or is flexibly distributed throughout the system.

> Thus when a cat turns its head to gaze at a passing mouse, the angle of tilt of the head and the degree of flexion and torsion in the neck will elicit a reflex modulation [or tuning] of the segmental apparatus such that a broadly stated executive instruction to "jump" will be realized as a jump in the right direction. . . . Clearly such modulation must precede the innervation of muscles or the cat would constantly miss the target; obviously a cat in flight cannot rely on corrective feedback. (p. 250)

The optic array provides the precise or unambiguous tuning parameters for "the generation of a precise, on target leap" (p. 252). The activation of coordinative structures must take place against a background of segmental relations properly tuned or organized, if the desired goal is to be achieved. "On activation of the action plan to pounce, the tuning parameters for the needed trajectory specified by the transformations in the optic array are given to the segmental system of interactions" (p. 252). That is to say, information and control can bypass the executive.

As the cat directs its gaze to the moving mouse, anatomically or mechanically induced segmental tuning is elicited reflexively, but Turvey (1977) says, "Reflex tuning induced by any particular orientation of the eye-head system is ambiguous with respect to distance" (p. 252). The required effort or force, however, is unambiguously specified in the optic array. The properties of optical stimulation that specify the coordinates of the mouse "with respect to the body axis, and its rate of direction of movement, do not enter into the executive decision, for most assuredly that would introduce undesirable delays" (p. 253). Conscious reflection is neither wanted nor needed. Higher order invariants specifying an affordance, such as the mouse, activate or, at least, motivate the strike action plan, and lower level properties of optical stimulation specify environment-related tuning and control functions.

Turvey (1977) proposes a "general principle" that "different properties of stimulation enter into the unfolding act at different levels" (p. 253). The "specification of action plans and the tuning of structures correspond to different properties of stimulation" (p. 257). Recall the relatively independent but complementary operations of environment-related tuning and executive procedures.

> In this cat-and-mouse story there are two main themes: one is that the *activation* of crudely stated action plans and environment related *tuning* are based on different properties of stimulation; the other is that the properties of visual stimulation that control movement and the family of possible tunings that effect the control are tightly linked. . . . [I]n *control*

> *reactions* the relation is between changing properties of stimulation and patterns of tuning, and in *identifying reactions* it is between nonchanging properties of stimulation and action plans. (p. 252, italics added)

The "detection of control-relevant optical properties" and the "specification of environment-related tuning parameters" are two sides of the same psychological-physiological event: "one is the dual of the other" (p. 258). With respect to the "representation of the action plan," "the description of the plan in action terms and the description of the plan in perceptual terms are dual statements about the same thing" (p. 258). Tuning is not restricted to the lowest order forms of invariant information. "Of the properties of stimulation relevant to the control of action, those of a higher order are realized as tunings in higher domains and those of a lower order are realized as tunings in lower domains of the action heterarchy" (p. 257). There must be continuity between information that specifies the goal of an action and information that specifies invariants relevant to control of action.

The dual-unity of executively activated procedures and tuning functions complements the dual-unity of unchanging optical stimulation that specifies the affordances and changing stimulation that specifies the location of environmental events. Both exhibit the dual-unity of higher and lower order levels of organization. Turvey (1977) explains:

> While the detection of higher-order invariants (affordances) may inject gross adjustments in locomotor activity, the fine control of locomotion in an object-cluttered and wrinkled terrain is through environment-related tuning which adopts the activity to the conditions by modulating a relatively small set of parameters, and does so *without involving the higher domains of the action coalition/heterarchy*. (p. 253, italics added)

The dual-unity of different properties of stimulation specify *what* something is (identity) and *where* it is (orientation).

> In the cat's field of vision the mouse is projected as changing patterns in the optic array. Concurrently, there is a pickup by the cat's visual system of those properties of stimulation that change over time and those properties that do not. The former specify how far away the mouse is, in

> what direction it is moving, at what rate it is moving, and where it will be in the following instant relative to the cat; the latter specify the mouse's identity as something that affords catching and eating. (p. 252)

The latter is what I conceptualized earlier in terms of highly abstract topological properties or subtle, higher order forms of invariant information.

Beyond movement-related segmental pretuning, locomotor cycles involved in continuous patterns of rhythmic movement such as walking or running require another kind of reorganization of segmental relations. Such reorganization or tuning, as Turvey (1977) says, is

> brought about *during* the execution of movements. . . . [F]ollowing the first few locomotor cycles the strategic ordering of muscle events in locomotion can be determined solely by the segmental system of relations. . . . [T]he supraspinal patterns of feed forward serve only to identify and to "trigger" the particular locomotor plan: the continuation of the plan, the subsequent locomotor cycles in walking or running is then the responsibility of spinal processes. Which is to say that control of locomotion is simply and elegantly transferred from supraspinal to spinal structures. Thus, locomotion exhibited in the pursuit by a predator of its prey could proceed with insignificant involvement of the highest sectors in the action system. If such is the case, then it would be propitious for the nervous system to exploit the principle of conveying visually specified adjustments in locomotion relatively directly to the segmental apparatus in which locomotion control is invested. (p. 254)

If control of *any* pattern of rhythmic movement or locomotor cycles can be transferred to spinal structures, then the relatively autonomous tuning of coordinative structures must play an important and intelligent role in intellectual forms of activity. Consider activities such as the letter A writing task discussed earlier. Writing a meaningful abstract symbol or sequence of abstract symbols is a functionally specific or goal-directed sequence of locomotor cycles that can be explained in terms of the same concepts and processes as walking, running, jumping, or climbing. Action-perception system theory explains all goal-directed movement both in terms of higher and lower order forms of perceptual information and in terms of the integrated operation of executive procedures and relatively autonomous tuning of action structures. Traditionally, walking or running are

conceived in terms of other-organized motor system actions, whereas abstract intellectual activity is conceived in terms of sensory system activity. This is the Cartesian dichotomy between conscious intelligence and unintelligent motor activity. But the action-perception system is a functionally and ontologically unified, self-organizing, and living sensorimotor system. They key theoretical distinction between running and writing is quantitative rather than categorical. Running requires more strength and movement than writing. It takes greater strength to use a hammer than it does to use a pencil. Although forms of movement vary, they are not different in kind. Both are made possible by executive activation and tuning of the spring-like organization of coordinative structures. Intellectual activities are therefore partly a function of intelligent action structures that operate according to physical or natural law. In other words, intellectual activity--if it is to be understood at all--must be understood, at least partly, in terms of the world of extended order and physical law. The institutionalized division between the sciences and the humanities is an artificial construct that is not based on natural or physical law.

Now we shall review and summarize some of the most basic principles of motor and action system concepts. Orthodox psychology, according to Reed (1982, 1996), conceptualizes action in terms of a mechanical motor system that produces movement in unthinking and passive conformity with either the commands of an autonomous intellectual faculty or the demands of other people and physical forces. In all cases action is regulated from outside the motor system or unthinking body. Regulation of a motor system reflects the traditional dichotomies between the animal and environment and between the mind and body. Competition for regulating the operation of the motor system implies the traditional assumption that autonomy and sociability are mutually exclusive categories of behavior.

The ecological approach conceptualizes action in terms of an action system. According to Gibson (1979), Reed (1982, 1996), and Turvey (1977, 1990), action is regular without being regulated. In contrast to the movements of a motor system, the

movements of an action system are self-organized and regular in two senses. First, agency and information function within the system at many different levels. Both are flexibly distributed and function autonomously even at lower levels. Executive procedures are not reducible to a fixed anatomically specific structure but are functionally specified. The organization of the action system as a whole, including the specification of which anatomical structures will perform specific functions (i.e., executive), is determined by the goal or invariant-intent of an action. An executively specified abstract action plan ambiguously specifies the organization of a movement pattern. But the more precise form of organization is autonomously specified by lower levels of the system according to environmentally and goal-specific information not shared with the executive. That is to say, the lower levels autonomously attune themselves to the particulars of the context of action. Second, the action system is self-organizing in the sense that the physical properties or spring-like organization of action structures or functionally specified muscle groups also serve to simplify executive control and epistemological requirements. An abstract and goal-specific action plan specifies an equivalence class or invariant range of different possible movement patterns from which action structures themselves choose the optimal pattern. Once the executive activates a cycle of locomotion and a lower system selects the appropriate variant, the action structure autonomously constructs the pattern of movement. Because lower systems autonomously regulate movement both according to their own privileged information and in virtue of the spring-like organization of action structures that, once activated, autonomously construct movement patterns, the executive cannot and does not need to know every detail in advance of an action or need to control every detail of a cycle of movement. Hence, the executive does not need to manage the massive and incoherent complexity entailed by the exclusively top-down, associationist concept of perception and action control. The future, by definition, is not already given and is not encoded in the present state of the system or in an initial intent or action plan. Simply put, the

ecological solution is incarnate or embodied intelligence supported by a world of physical forces and controlled by goal-specific, environmentally based perceptual information. Although the activity of the self can be impeded by other persons, the self's own body, or physical forces, the existence and unimpeded activity of the self is made possible by embodied intelligence operating according to the customs of culture and laws of physical reality. Autonomy is not a matter of unlimited degrees of free movement, but a matter of mastering the degrees of freedom afforded by the social and physical environment. Sociability and physical forces are what make autonomy possible.

The illusion of a dichotomy between mental and physical activity may be partially grounded in teaching and learning practices. Gilbert Ryle (1949) draws a sharp contrast between learning by "concurring" and learning by "operating" (p. 306). Learning by concurring is largely a matter of passively receptive, immobile observation of what is done by another or is otherwise present to awareness, whereas learning by operating is primarily a function of constructive and exploratory action. The former is conceptualized in terms of the "contemplative" idiom, while the latter is conceptualized in terms of the "constructive" idiom (p. 306). The contemplative idiom conceives of learning in terms of "following" arguments and "seeing" the validity of proofs or demonstrations, whereas the constructive idiom conceives of learning in terms of being able to "do" arithmetic or clearly written papers and being able to "solve" equations or problems (p. 306). Ryle says that

> when children are given their elementary instructions in geometry, the proofs of the theorems are commonly presented to them printed in books, or written on the blackboard. The task of pupils is to study, follow and acquiesce in those proofs. They learn by concurring. But when they are given their elementary instruction in arithmetic and algebra, they are set to work in quite a different way. They have to do their own adding, subtracting, multiplying, and dividing. Nor do they study classical solutions of equations; they have to solve their own equations. They learn by operating. (p. 306)

While orthodox concepts of minds imply that these two approaches to learning are reducible to the operation of two anatomically distinct structures, the ecological concept of mind implies the functional and ontological inseparability of two approaches and emphasizes the necessity of action or learning by operating. According to Ryle, the unreflective acceptance of epistemological dichotomies may be rooted in the language and organization of subject content.

> Formal logic was, unfortunately, taught from the start in the esteemed geometrical manner, with the result that the epistemology of ratiocination and of intellectual work in general continues to be told chiefly in the contemplative idiom, that is, in terms appropriate to classrooms furnished with blackboard, but no pens or paper, instead of terms appropriate to classrooms furnished with pens and paper, but no blackboard. We are given to understand that to "cognise" is not to work something out, but to be shown something. Had arithmetic and chess been brought into the curriculum before geometry and formal logic, theorizing work might have been likened to the execution of calculations and gambits instead of the struggle for a bench from which the blackboard can be clearly seen. We might have formed the habit of talking of inference in the vocabulary of the football field, instead of that of the grandstand. (p. 306)

This passage implies, or at least suggests, why, as Gibson (1979) says, "the geometrical habit of separating space from time and imagining sets of frozen forms in space is very strong" (p. 74). Viewing presentations on blackboards and orthodox concepts of knowing or perceiving are analogous in several ways. The known object is given and is unaffected by detached, stationary, and frontal viewing. The general implication is that therapy for orthodox epistemological misconceptions is to begin with better curriculum organization. Learning should first emphasize exploratory and problem-solving action.

Learning, according to the geometrically oriented concepts of mind, is a function of passively receptive perceiving enriched by mental activity. Perception, conceived in terms of five anatomically and epistemologically isolated, passively receptive, and permanently fixed capacity channels of sensation, *is not* modifiable by learning. For the ecological concept of mind, the five senses are used systematically in a functionally and

epistemologically unified manner. Information is amodal. Perception is an active and overt mode of attention that *is* modifiable by learning. Contrary to orthodox assumptions, attention is not simply a matter of exclusive or narrow focussed gazing. Gibson (1979) says that "attention is not only selective, it is also integrative. Attention can be distributed as well as concentrated. The awareness of details is not consistent with awareness of wholes. Each fact implies the other" (p. 231). The reductive assumption is that perception proceeds by directing attention exclusively to isolated objects of conscious awareness, whereas the ecological approach presupposes that perceiving in ordinary, qualitative experience proceeds by attending to particulars that emerge from a background or context through exploratory observation. A context is what makes particulars possible.

> We are tempted to think of attention as strictly a narrowing-down and a holding-still, but actually this is rare. The invariants of structure in an optic array that constitute information are more likely to be gradients than small details, and they are scanned over wide angles. (p. 246)

Of course, the reductive emphasis on what is most clearly present to conscious awareness does not recognize attention as a learned skill but a matter of undeniable certainty. Gibson explains:

> In the case of the special sense the process of attention occurs at centers within the nervous system, whereas in the case of the perceptual system attention pervades the whole input-output loop. In the first case attention is a consciousness that can be focussed; in the second it is a skill that can be educated. (p. 246)

Attending to the objects of qualitative experience, considered holistically, depends on what is both present to and absent from conscious awareness. As Turvey (1977, 1990) explains, perceptual control of action proceeds largely, and at times entirely, beyond the view of conscious awareness. Also, recall that information and control operate with relative autonomy at every level of the central nervous system (CNS) and that formless invariant-structures are not themselves objects of conscious awareness but relations between things that can be visualized or pictured.

Attention is a skill that can be educated because the perceptual system can become attuned to invariant-structures specified by information in the current context of experience or environment. Instead of being corrected, enriched, and constructed according to images from memory, the system, through practice, can become sensitive to the self-sufficient and coherent structure of environmental information. For the perceptual system, Gibson (1979) says, "*new sensations can be learned*" (p. 245). The burden of coherent structure and inexhaustible complexity is shifted from the mind to the world of qualitative experience. Explaining further, Gibson says that

> Evidently the theory of information pickup does not need memory. It does not have to have as a basic postulate the effect of past experience on present experience by way of memory. It needs to explain learning, that is, the improvement of perceiving with practice and the education of attention, but not by an appeal to the catch-all of past experience or to the muddle of memory.
>
> The state of the perceptual system is altered when it is attuned to information of a certain sort. The system has become sensitized. Differences are noticed that were previously not noticed. Features become distinctive that were formerly vague. But this altered state need not be thought of as depending on memory, an image, an engram, or a trace. An image of the past, if experienced at all, would be only an incidental symptom of the altered state. (p. 254)

Gibson's point is not to deny that "reminiscence, expectation, imagination, fantasy, and dreaming actually occur. It is only to deny that they have an essential role to play in perceiving" (p. 254). Simply put, perceiving is based on detection of environmental invariants, not on memory. The "*attuned*" system "*resonates*" to the invariant structure of a persisting thing but must "*abstract*" the invariants of substantially distinct things (p. 249). Either way the state of the system changes in a way that is uniquely specified by the invariant in question.

> The perceiver extracts the invariants of structure from the flux of stimulation while still noticing the flux. For the visual system in particular, he tunes in on the invariant structure of the ambient optic array that

> underlies the changing perspective structure caused by his movements. (p. 247)

While the tuning of the action system and resulting control of action are based on changing properties of stimulation or lower order forms of invariant information, the desired goal or basis of invariant-intent and perceptual tuning is unchanging properties of stimulation or higher order forms of invariant information. Tuning of the action system and the perceptual system form a complementary dual-unity of change and nonchange whereby the state of both systems as a functional whole is altered or changed according to information unique to the current context of qualitative experience.

Insofar as we accept the necessity of environmentally sensitive tuning processes, we must question the value of personality theories, learning theories, and methods of instruction that conform to the principles of reductive concepts of mind. Reductive theories imply practices that fail basic reality tests. Students, for example, may be categorically defined as either self-motivated or other-motivated learners regardless of subject matter or situation. The implications of orthodox approaches are more about making the world fit a hypothetical psychological reality than discovering a full range of possibilities for action and perception. Two basic epistemological assumptions are sources of trouble. First, Gibson (1979) suggests that "perfectly reliable and automatic tests for reality are involved in the working of the perceptual system. They do not have to be intellectual" (p. 257). That is to say, they do not have to be Cartesian. Second, remember that orthodox concepts of mind, in principle, cannot distinguish memory from perception or perception from imagination because the causes of internal representations of external things (or external things themselves) cannot be verified. Gibson elaborates upon two basic reality tests. The first emphasizes the inexhaustible wealth of reality.

> An imaginary object can undergo an *imaginary* scrutiny, no doubt, but you are not going to discover a new and surprising feature of the object this way. For it is the very features of the object that your perceptual system has already picked up that constitute your ability to visualize it. The most decisive test for reality is whether you can discover new features and

> details by this act of scrutiny. Can you obtain new stimulation and extract new information from it? Is the information inexhaustible? . . . The imaginary entity cannot pass this test. (p. 257)

Objects or images of imagination or memory are not altered by changing perspective structure. A second reality test emphasizes the significance of fully embodied perception or exploratory action.

> A related criterion for the existence of a thing is reversible occlusion. Whatever goes out of sight as you move your head and comes back into sight as you move back is a *persisting* surface. Whatever comes into sight when you move your head is a *preexisting* surface. That is to say it exists. . . . Hence, a criterion for *real* versus *imaginary* is what happens when you turn and move. (p. 257)

Insofar as we believe that categories of thought are exhaustive and final measures of reality, action and perception are constrained in a corresponding manner. For instance, the division of labor into intellectual and manual skills is functional, but when one group has little or no significant experience of what the other group does, the illusion of categorically distinct orders of intelligence may arise. A lack of exploratory efforts helps to confirm the reality of the illusion. Attunement to what there is to be perceived helps us to overcome the problematic limits of such illusions and to simultaneously act accordingly.

The ecological approach places a renewed emphasis on qualitative experience that cannot be matched by traditional forms of empiricism. Traditionally, the body is conceived to be an unthinking motor system that must be activated and regulated by extra-systematic intelligence. The exclusively other controlled machine or motor system seems to imply a dichotomy of opposed causal power whereby *either* an autonomous self controls the machine (consequently, defining the self as autonomous and strong) *or* other persons and physical forces control the machine (consequently, defining the self as sociable and weak). The antagonism is implied or at least suggested by the question of separate and competing causal powers and a machine that does not move or control itself. But the body conceived in terms of a perception-action system is a self-organizing

system. Activation, tuning, and control emerge from within the animal-environment system. Agency and epistemological functions are flexible and decentralized. Turvey (1977) says that "the elegance of tuning as a control process is that it permits the regulation of an autonomous system without disrupting the system's autonomy" (p. 240). With the systematic conception, autonomy and control are not competing but complementary forces. Autonomy is defined in terms of continuous systematic support of goal-directed action instead of discontinuity and exclusion of all that lies beyond the self. Autonomy is defined not in terms of isolation but in terms of connection with a world of others and physical forces. All of this defines learning in terms of being-in-the-world instead of competition for control of a machine that houses the self.

Learning should be more devoted to the nature of various subject matters than to reductive learning theories insofar as the world is a self-sufficient source of coherent information. A priority on the authority of the current context should be emphasized. Creatively adapting or successfully conforming to the surprising, novel, or unique quality of a current situation cannot be adequately understood solely in terms of static principles of operation. The top-down model of action control asks us to believe that the final state or goal state of every act and therefore every course of action must be encoded in the initial action plan. This implies that the future is somehow already given. Such thinking, however, implies unimaginable complexity and numerous, insoluble paradoxes. Because traditional theories subordinate and reduce the dynamic components of experience to static forms of organization, they have no terms or ideas that are commensurable with the complex variability that, for ecological theory, is handled by the perceptually controlled tuning of action structures. Traditional concepts therefore seem to miss the point of attunement. This is also because the mind-body dichotomy is manifested in the static-dynamic dichotomy. One mode of experience is valued more highly than its necessary complement. I suggest that the constancy of orthodox concepts of mind is largely reducible to the information that ecological theorists have reconceptualized in terms of

the unchanging properties of visual stimulation or higher order forms of invariant information. Because such properties, for the moving observer, neither result from nor are changed by movement or action, they are well suited to the aims of reductive epistemological thought. The knowing subject and the known object *appear* as independent existences. The known object is supposedly uncorrupted by subjectivity. The problem, as I have argued, is that such invariants cannot be picked up by the mind alone. The supposed practical or classroom confirmation of orthodox concepts of learning may therefore have more to do with a teacher's or student's power of attunement than with theoretical wisdom.

CHAPTER 5
LEAR AND BENJAMIN ON FREUDIAN PSYCHOANALYTIC THEORY: AUTONOMY AND SOCIABILITY OR THE EMOTIONAL SYSTEM

The main purpose of this chapter is to explain the individuation process, i.e., the individual as a developmental achievement and the cognitive and interpersonal implications of different levels of development. Successful individuation is accompanied by the disappearance of recurring episodes of impulsive behavior and related disruptions in perceptual activity. Behavior reliably proceeds according to systematic, coherent, and functional character organization. Individuation is a developmental process by which one becomes aware of oneself as a separate and unified locus of desire and agency. That is to say, one becomes aware of oneself as a differentiated-unity. The therapeutic purpose of this chapter is to explain what various levels of individuation or development imply for the traditional theoretical dichotomy between sociability and autonomy. *The general thesis of this chapter is that while lower levels of development imply that autonomy and sociability are incompatible (or that one must be either one or the other), higher levels of development imply that autonomy and sociability mutually complement one another (or that one can and should be both autonomous and sociable).* A coherent concept of an individual must consider variable levels of individuation.

The following summary reflects the general organization and content of this chapter. Lear's (1990) discussion of Freudian psychoanalysis presupposes a critical distinction between Freud the "practitioner" and the "theorist" (p. 5). While Freud's explicit theory of mind is largely reductive and mechanistic, his clinical writings imply a much more holistic and ecological orientation that serves to complement the ecological concept of cognition developed in Chapter 4. The reductive approach is evaluated and criticized as it emerges from the main discussion of the ecological approach. I begin by

reviewing and summarizing psychoanalytic theory; the first two-thirds of the chapter emphasizes the writings of Lear (1990, 1998), and the final third emphasizes Benjamin (1988). While Lear emphasizes the psychology of the individual, Benjamin focuses on interpersonal relations and intersubjectivity.

Lear's (1990, 1998) psychology of the individual begins, first, with a distinction between primary and secondary process mental activity. This distinction is the key to everything that follows. In all cases, development implies that primary process activity is given secondary process forms of organization. Second, the concept of a drive is explained as the basic component of individual development. Third, cognitive individuation is distinguished from emotional and motivational individuation. The principles of associationism obscure this distinction. Fourth, repression is defined as the inhibition of development. Repression produces chronic symptoms that threaten the integrity of the individual. The undeveloped drives of the group or mass may also threaten individual integrity. Fifth, wishes are distinguished from desires. Desires are maturely developed wishes. Sixth, well-developed emotions and motivational states are conceived as ecologically oriented and justified. Seventh, Lear shows how the mind recognizes itself in diverse symptoms or symptomatic forms of behavior. The key is that recognition produces the transformation and disappearance of symptoms. Language is essential. Traumatic past events must be reenacted and put into words. Eighth, the mechanical and ecological concepts of catharsis must be distinguished. Ninth, the process of individuation is explained and love is defined as a force that promotes individuation. Tenth, the internalization and owning of cultural and moral authority is explained. The pathologies of this process lead to the false inferences of a two- or three-part soul.

Next is Benjamin's (1988) account of Winnicott's version of Freud's theory of interpersonal relations. Benjamin extends Lear's discussion of the individuation process into the domain of interpersonal relations. Interpersonal relations that make development or individuation processes possible are distinguished from those that tend to have the

opposite effect. Undeveloped forms of autonomy and sociability are distinguished from well developed forms of autonomy and sociability. The clarification of this distinction largely completes the reconceptualization of the individual in ecological terms. The focus is on emotional and motivational individuation processes and serves to complement the concept of cognitive individuation implicit in Chapter 4. Next is Lear's account of the constancy and objectivity of human values. This argument complements Gibson's account of affordances. Last, there is a brief description of character education.

The second and third chapters of this study show what Cartesian and Humean approaches to moral psychology imply for the individual's achievement of a sense of well-being and individuation. Although Descartes places a greater emphasis on the pathology of impulsive behavior, both rationalist and empiricist approaches imply that moral constancy is accompanied by a sense of well being and healthy self-esteem. Emotional stability or an ongoing absence of internal conflict accompanies an enduring state of moral constancy. Doing right by others and oneself is therefore an end in itself continuous with an end beyond itself. According to the concept of lived embodiment, outlined in the first chapter, moral constancy is accompanied by a sense of self-efficacy and world-disclosive psychological and physiological states that are characteristic of unimpeded activity. A sense of well-being is afforded by a secure connection to the world of action and perception. Frustration and disappointment that is produced by the separation from and loss of external goods may cause morally and individually unacceptable internal conflicts and consequential impulse control problems. Such impulses and conflicts may be identified as dys-appearing modes of embodiment and may be felt as an intentionality disrupting visceral presence or a similarly disruptive presence in the action structures (or both). Such episodes undermine the integrity of the individual, in which case impulsive behavior must be regulated externally or extra systematically by either the self or others.

One's sense of well-being is impaired to the extent that world-concealing psychological and physiological states obscure one's connection to the world. Perceptual control of action is impeded. The conclusions of the second and third chapters are that neither Descartes nor Hume give us an adequate explanation for resolving problematic impulses that are modifiable neither by rational nor empirical learning processes. The present chapter aims to provide a solution. Rational and empirical approaches must be reconceptualized and integrated. For education, it is not just the transmission and preservation of socially and culturally sanctioned values and practices that are at stake, but an individual's ongoing sense of well-being.

In the most general and abstract terms the individual must learn both impulse control and to establish unambiguous personal boundaries. Cartesian autonomy aims to protect the I or ego with strong *defensive* structures that are supposed to regulate individual impulses and the internal consequences of external influences (that in turn product problematic impulses). Descartes (1649) says that "firm and determinate" judgments that are based on knowledge of good and evil are the "proper weapons" with which the soul "conquers" the passions (p. 347). We should resist or even abolish desires or impulses that conflict with long-term goals and coherent personality organization. Descartes explains:

> My third maxim was to try to conquer myself rather than fortune, and to *change my desires rather than the order of the world*, and generally to accustom myself to believing that there is nothing in our power except our thoughts. . . . And this alone seemed to me to be sufficient to prevent me from desiring anything in the future that I could not obtain. (Benjamin, 1988, p. 180, italics added)

Therapy consists of establishing new habits of thought by means of frequent repetition to oneself of compelling rational, demonstrative arguments that are designed to break intentionality disrupting associations and form new more desirable ones. Therapy is thus confined to proposition-based intellectual reflection. But Freud, according to Benjamin

(1988), shows that "controlling our thoughts is not sufficient to change our desires. He revealed that even in withdrawing from the world the ego remains subject to the pressures of the unconscious which confront it as 'external' reality" (p. 180). As I argue in the second chapter of this study, Descartes draws the boundaries of the mind or self too narrowly.

Lying near the opposite pole of traditional philosophical prejudice is Hume's solution. Learning is largely a matter not of reflective thought but of experience-based habit formation. Arguing against the efficacy of the Cartesian approach, Hume (1740) says that

> I may have recourse to study and reflexion within myself; to the advice of friends; to frequent meditation, and repeated resolution: and having experienc'd how ineffectual all these are, I may embrace with pleasure any other expedient, by which I may impose restraint upon myself, and guard against this weakness. . . . Men are not able radically to cure, either in themselves or others, the narrowness of soul, which makes them prefer the present to the remote. *They cannot change their natures. All they can do is change their situation*, and render the observance of justice the immediate interest of some particular persons, and its violation their more remote. (p. 45, italics added)

According to the traditional dichotomy between autonomy and sociability, change is a function of either internal or external influences, either reason or experience, and perhaps, change is based on either propositional or non-propositional processes. Although Hume's concept of mind includes non-propositional or unconscious thought or association formation processes, only probabilistically determined belief or habit formation is a learning process. All other associations are not learned but, by means of native capacities, are formed automatically and involuntarily. Passions, for instance, are involuntarily associated according to resemblance of orientation or direction and hedonic quality. Also, habit formation itself is based on or presupposes recognition of resemblance. Once the general organization of a character is permanently established, unacceptable impulses must be controlled by external or extra-systematic influences.

Intelligence is therefore thought to reside outside of the body or motor system. Control the environment in order to control impulsive individual behavior. But, unlike Descartes, who thinks of the external world primarily as a source of vulnerability and pain, Hume generally supposes that the world is a cause of individual power and well-being. Although bad habits or impulses are a genuine source of trouble, good habits are also as reliable and durable as the operation of natural law. The character formation process must therefore begin as early as possible.

The psychoanalytic concepts of mind show that mental activity includes a far wider range of bodily appearances than can be comprehended by traditional reductive approaches. The ecological approach is holistic and comprehensive. Because there is a functional and epistemological discontinuity between, on the one hand, the conscious self or the I with its internalized system of interpersonally oriented rules for behavior and, on the other hand, unruly or forbidden impulses, traditional concepts of mind imply that there is an ontological difference or dichotomy between the mind (ego and internalized rules) and the body (source of impulses). Whether impulses are regulated by the ego (internally) or by others (externally), they are encountered by the ego and others from an *external* perspective. In more precise terms, they are encountered by others from a third-person perspective and the ego from a third-person-like perspective. Unruly impulses actively oppose the I's or ego's volition and are opaque to the ego's conscious understanding. The ego encounters them as alien or wholly other. Unruly impulses must therefore be passively suffered or actively overpowered. Insofar as behavior conforms to an individual's wider system of belief in spite of lawless and undesired impulses, it *appears* to be externally regulated in a forced or coercive manner. Hence, there is a conflict in which one side or the other plays the larger causal role. Theorists traditionally infer extra-systematic regulation of action as a general principle. According to the psychoanalytic concept of mind, however, *unruly impulses are an extension of the mind or I's own activity*. The ego, which operates at higher or more complex levels of

organization, does not easily recognize as its own motivational states or impulses that operate at a lower or less complex level of development. The mind, as traditionally conceived, does not know itself very well. Traditional concepts of mind simply do not include adequate concepts of developmental processes and consequently of different levels of psychic organization. Lear (1990) says that "modern philosophy in general has a tendency to investigate the structure of the human soul in isolation from any consideration of how that structure came about" (p. 186). That is to say, growth or dynamic, developmental processes and distinct kinds of mental processes are not considered, while the mind is conceptualized as a timeless or unchanging structure. The individual is thereby reduced to a particular stage or state of development.

According to psychoanalytic theory, mental processes are of two basic kinds, namely, primary and secondary. The unification or integration of these two kinds of mental processes constitutes development and results in coherent character functioning. The most basic principle of primary process activity is association of images and things by resemblance. The emphasis is on connotative meanings that are frequently unique to an individual and associations that are formed unreflectively or unconsciously. There is neither reality testing nor critical evaluation. Primary process activity produces dreams and fantasies. Secondary process activity consists of conceptual thought, and the emphasis is on shared, denotative meanings, critical evaluation, and reality testing. Associations are organized according to more complex systems of laws and principles such as those of logic and grammar; resemblance is only one among many higher order principles. Lear (1990) says that

> primary-process mental activity tends to be expressed in concrete images, rather than concepts,and tends to proceed by loose associations. That is, from the point of view of the secondary-process mind that is trying to understand it, primary process seems to slip along a path of superficial similarities. And primary process pays no respect to logic. "Thoughts which are mutually contradictory make no attempt to do away with each other," Freud says, "but persist side by side." (p. 76)

Resemblance or similarity of any kind whatsoever is the most basic principle of unconscious or archaic organization. There are no a priori limits on the superficiality or the kinds of resemblances that form associations. Things or images, for instance, may be associated according to size, shape, color, smell, tactile quality, taste, or hedonic quality. The overall emphasis is on visual and auditory imagery. Rycroft (1972) explains that primary process thinking displays "condensation" and "displacement," whereby ideas and images are "relatively interchangeable" (p. 48). Hence, "One idea or image readily symbolizes another" (p. 48). Associations that are governed by resemblance of direction or orientation imply secondary process activity. In the "secondary-process thinking of conscious rational thought, images, ideas, and words have relatively constant value and meaning" (p. 48). Ambiguity is resolved through reorganization. Rycroft describes the psychic energy of unconscious processes as "free or *mobile energy*" and characteristic of the "unstructured" parts of the mind or unconscious whereas the bounded energy of secondary processes is "relatively immobile" and characteristic of the structured part of the mind or the ego (p. 48). Secondary process thought is also primarily functional or goal oriented. As the restless psychic energy of primary process activity is integrated with secondary process thought, it acquires a more complex level of structure or organization. Although there are only two kinds of mental processes, various levels of integration between the two cannot be limited. Hence, various levels of complexity of organization cannot be limited. Even though continuity is not always obvious, the two processes operate at opposite poles of the same mind. Primary and secondary processes operate simultaneously, but conflicts are largely between simultaneously operating, higher and lower levels of psychic organization that exhibit disparate orientations.

According to Lear (1990, 1998), insofar as self-interpretation is combined with a subtle and detailed understanding of one's own developmental processes, it can be an effective means of integrating primary and secondary process activity, thereby developing individual control of impulsive behavior. Recall that Descartes has no concept

of unconscious developmental processes, and Hume has no well-developed concept of them. Because impulsive behavior operates largely, if not entirely, according to the principle of primary process activity, the Cartesian ego, which is confined to secondary process thinking, is unable to recognize them as its own. Hence, the ego or I that knows its impulses are poorly organized and disruptive but does not understand why cannot *intelligently* direct those impulses. The ego or the I therefore encounters its own poorly organized impulses as external, problematic objects of awareness or as instances of bodily dys-appearance. As character as a whole becomes well organized, a coherent system of beliefs and desires emerges. As development proceeds, impulses that emerge from the unique nature of a living, animate organism are shaped by conscious or propositionally based levels of organization. Some impulses escape this process of organization and unification. According to Lear (1998) such impulses are "removed from the network of propositional attitudes--and thus cannot be worked over in thought" (p. 107). They are not yet "fully formed" psychological states or volitional dispositions (p. 107). These impulses are the main source of trouble and confusion.

Coherent, conscious character organization is achieved by developing habits of being affected by and acting according to the demands of one's own unique nature and the demands of various contexts of action and interpersonal relations. This will be a recurring, developmental theme in this chapter. Because experience by itself can be an extremely unforgiving teacher, intelligent and coherent character formation must be directed by well organized instruction and caregiving. As development proceeds, there is a progressive shift in emphasis from non-propositional to propositional forms of communication and thought. Propositional forms of communication are *essential* for the full or mature development of archaic motivational states or primitive dispositions. A primitive disposition that has been isolated from the development process "generally displays an impulsive aspect relatively out of harmony with the subject's usual motivational patterns" and is "fairly easy to isolate from the overall trend" of an

individual's activity (Laplanche & Pontalis, 1973, p. 4). For psychoanalytic theory, drives are basic, the native elements or components of character. Elaborating upon this, Lear (1998) says that "drives" are "those basic impulsive forces which represent bodily needs" and "incorporate the social environment for their very constitution" (p. 94). Undeveloped drives are "relatively indeterminate" or ambiguously structured with respect to patterns of actions that they produce as well as objects of drive satisfaction(Laplanche & Pontalis, 1973, p. 214). According to Freud a drive is a living, organically or physiologically based disposition that is shaped and directed by means of culturally constructed symbols. Freud says,

> By a "drive" is to be understood *the psychological representative* of an endosomatic, continuously flowing source of stimulation, as contrasted by a "stimulus," which is set up by a single excitation coming from without. The concept of a drive is thus one of those lying on the frontier between the mental and the physical. The simplest and likeliest assumption as to the nature of drives would seem to be that *in itself a drive is without quality*, and, so far as mental life is concerned, is only to be regarded as a measure of the demand made upon the mind for work. (Lear, 1990, p. 21)

Although, in this passage, Freud proposes that a drive is an unqualified or unstructured quantity of motivational energy, Lear argues that Freud's concept of mind is better understood when we suppose that an undeveloped drive is an ambiguously structured or qualified source of motivational energy. Physiological impulses thus have some native psychological qualities such as the capacity for non-discursive symbolic activity. In part, drives are native dispositions that produce a wide range or broad equivalence class of functional action patterns and an even wider range of symbolic meanings. The frontier between the organic and the symbolic, the transitional space in which culture shapes individual organic dispositions, also forms the transition between shared discursive and individual non-discursive forms of symbolic activity. The intelligent direction and formation of impulses functionally integrates or unifies the two domains. As drive

activity is integrated with secondary process activity, it achieves more complex structure or qualities while infusing those structures with life.

The psychoanalytic concept of mind conceptualizes the undeveloped or immature individual as a collection of sub-individual and pre-personal components or drives. Drives may also be thought of as enduring and continuously existing proto-desires and proto emotions. As a group they are referred to as the "id" or "it" (Rycroft, 1995, p. 74). Freud postulates a number of relatively distinct drives or instincts, for instance, the dual-unity of the sexual and self-preservative drives. Freud also postulates an organic source of motivational energy or libido that is actualized in the form of a sexual drive, the general aim of which is to achieve sexual intercourse and biological reproduction. With sublimation this energy is desexualized and directed toward conservative and creative cultural reproduction; consequently, the sexual drive is differentiated into a number of relatively distinct morally and culturally distinct drives and corresponding forms of activity. Symbolic reproduction is sublimated organic reproduction. Laplanche and Pontalis (1973) explain that sublimated activities "have no apparent connection with sexuality but . . . are assumed to be motivated by the force of the sexual instinct. The main types of activity described by Freud as sublimated are artistic creation and intellectual inquiry" (p. 431). Rycroft (1995) says that sublimation is a "developmental process" that implies an "evolution of 'higher functions' from lower ones" (p. 176). According to Laplanche and Pontalis (1973), "Freud was always critical of any theory of instincts resembling a catalogue, postulating as many instincts as there are types of activity--invoking a 'herd instinct,' for instance, to account for the fact of communal life" (p. 74). Development is based on the progressive organization of individual drives and the organization of the drives as a unified, functional, and meaningful whole. Lear (1990) says that humans are "pressured to live. The drives are continuous, internal sources of pressure" (p. 122). A living organism, in contrast to an unthinking machine, is never completely inactive. Physiologically, the body is always metabolizing internalized

nutrients (organic activity) while psychologically primary process activity is always metabolizing or incorporating internalized elements of the structure of the external or interpersonal world (symbolic activity).

Drives have three essential characteristics. First, an undeveloped drive is a biological, physiological, or organic and continuously flowing source of motivational energy that is ambiguously structured with respect to its aim and object. Hence, the discharge of a specific quantity of energy is never completely without qualification or structure; otherwise, there would be nothing for culture to shape or organize. Second, the aim of a drive is the range of action patterns that it produces. The range includes physiological functions and symbolic forms; the latter may enhance, preserve, or distort functioning. Drive satisfaction is achieved through action. Third, the object of a drive is the means by which various patterns of action can be performed. The object affords drive satisfaction. Again, symbolic substitution can be expected. "Drives," Lear (1990) say, "are a continuous source of pressure within human life. And this pressure has a distinctively psychological aspect. The meaning of a drive, therefore, is not given merely by its functional role within the organism" (p. 125). The meaning of a drive is much wider than its function.

An instinct, in the classical or strictly biological sense of the word, must be distinguished from a drive. An instinct, in this more restricted sense, is confined to purely functional patterns of action. An instinctual pattern of action unfolds according to a temporally conditioned scheme that generally resists change. Psychoanalytic writers, even Freud, do not always distinguish drives from instincts. While making it clear that we should, Lear (1990) says,

> An *Instinkt*, for Freud, is a rigid, innate behavioral pattern, characteristic of animal behavior: e.g., the innate ability and pressure of a bird to build a nest. It is the essence of an *Instinkt* that it could not have a vicissitude: The pattern of behavior that it fuels and directs is preformed and fixed. (p. 124)

A mature instinct is quantitatively and qualitatively specific and develops without extensive learning or formal instruction. Full development is largely a biological matter. Experience by itself is a good teacher. Explaining further, Lear says that "*a Triebe* [drive], by contrast has a certain plasticity: its aim and direction is to some extent shaped by experience. To conceive of humans as powered by *Triebe*, as Freud did, is in part to distinguish humanity from the rest of the animal world" (p. 124). On the one hand, because an instinct is a self organizing or self-structuring source of psychic energy, variations in its aim and direction are generally not a source of trouble. Emotional stability can be taken for granted. On the other hand, because a drive is not wholly self-organizing and it is vulnerable to involuntary episodes of disorganization or intentionality-disrupting episodes of regression into earlier, less organized psychic states, new learning is frequently needed. Intentionality is disrupted when the ego or the I does not recognize the source or the meaning of its own symbolic or symptomatic acts. Lear (1998) calls such an episode a "moment of reflexive breakdown" (p. 103). Lear argues that although drives are disposed to achieve higher levels of organization, they must be given direction by intelligence that is already operating at a higher level of organization, i.e., a parent or teacher.

Lear argues that the drives must be well developed if there is to be a *true* or *individuated* individual. Awareness of the self or the I as *a psychic unity that is distinct from others* is the essence of individuation. According to Lear (1990), "Being an individual is, psychoanalysis discovered, a psychological achievement: for the ability to distinguish oneself from the environment is not present at the beginning of biological or social life" (p. 23). Moreover, the achievement comes about incrementally. Although infants learn very early a unified sense of their own agency and that their actions are distinct or separate from the actions of other persons and the physical world, similar development and recognition of the unity and independence of individual affective and motivational states takes longer. In other words, recognition of one's own cognitive states

and dynamics is distinct from recognition of one's own motivational and affective states. The former operate according to a strictly functional mode of psychic organization, whereas the latter operate according to the principles of drive activity. With the operation of an instinct motivation and emotion are largely constant, whereas the operation of a drive proceeds with frequent and sometimes extreme variations in emotional-intent. So the reliable operation of a drive frequently cannot be taken for granted.

As Reed (1982) proposes, there are distinguishable action and emotional systems. Referring to an infant's strictly cognitive mode of self-awareness, Lear explains:

> Of course, this self-recognition may be rudimentary, and it will differ from the I's ability to recognize any other object in the world. In part, the I is presented to itself in its proprioceptive sense of its own limbs, its muscular power, and its non-discursive knowledge of what it intends to do, its perceptual perspective on the world. Thus the I's self-representation need not be from the side ways-on perspective. The point is only that the I must have a psychological awareness of itself as a unity. (p. 135)

During unimpeded goal-directed action, self-awareness is specified largely by what lies beyond the self in the structure of the optic array and is specified within the self through felt, physical effort as biological or organic energy is transformed into regularly structured locomotion that operates according to executive intent and physical law. In the language of the concept of the formal structure of lived embodiment, the body I am is functionally unified with the body I have by means of my performing well. Hence, the socially constructed idea that I am, say, a good golfer, a good baseball player, or a good dancer is integrated with my more general self-concept by means of my own performance; that is to say, in performing well, my self-concept is determined from a first-person perspective that proceeds according to the third-person or external perspective of cultural and natural law. My unimpeded performance thus unifies the first and third person perspectives while producing a secure sense of my own causal efficacy. This secure sense of differentiated unity cannot be taken for granted with respect to awareness of one's own subjectivity or states of emotional-intent. Lear (1990) says that

"a person is by his nature out of touch with his own subjectivity" (p. 4). The problem is that one's own affective and motivational states, at times, may appear to be caused by another, and the motivational and affective states of another may appear to be caused by oneself.

A sense of well-being accompanies the development of the elements of one's pre-individualized psychic life. That is to say, individuation and individuated psychic functioning are accompanied by a sense of well-being. Lear (1990) says that

> for an individual to come to be, he needs freedom from certain internal and external tyrannies. Internally, the individual may be tyrannized by subindividual psychic forces, which Freud called "drives," which may threaten and overwhelm the integrity of the individual. It is the task of individual development, as it is the task of psychoanalysis, to promote a healthy relation between an individual and his drives--a "healthy" relation being, from this perspective, one that promotes the growth and development of the individual. (p. 23)

Undeveloped drives may express themselves as proto-desires or wishes for what is taken by an individual to be unacceptable or forbidden by others and by that individual's conscious system of values and purposes. Because such impulses may be powerful sources of motivation that are isolated from the coherent system of rational or intelligent control, they can disrupt socially accepted patterns of behavior and thereby threaten an individual's sense of self-esteem and interpersonal security. Hence, "the mind may not be able to sustain self conscious experience of the fully developed emotion because, for example, the beliefs that justify and partially constitute the emotion conflict with other beliefs" (p. 50). When a forbidden wish or impulse is inhibited from expressing itself in the production of goal directed action, it appears in the form of chronic symptoms or dysfunctional actions that are not easily identified or recognized as forms of mental activity. The energy of a strong impulse will achieve overt expression in one form or another. A chronic symptom is a non discursive symbolic representation of the impulse or wish. By disguising the identity of the impulse, the mind protects or defends its conscious

awareness from its own threatening impulse. The wish and its emotion are said to be repressed. Lear (1990), explaining further, says:

> Repression is the archaic activity by which I deny that certain drives are a part of me. Repression is not just making a mistake about where the drives are in fact located; it is an active self-alienation of the drives. Through repression I can hold the drives at a distance, but if I hold them at too great a distance, I become their victim. (p. 173)

Symptomatic acts or hysterical symptoms such as a "paralyzed leg," a "false pregnancy," or an "irritable bowel" can be quite debilitating (p. 7).

Drives may also threaten the integrity or the development of the integrity of the individual as pre-individualized and *transpersonal* elements of psychic life. Lear (1990) says,

> Externally, the individual may be threatened by these very same drives, now located in the social world. . . . If the individual is a psychic achievement, and if the drives are the pre-individualized elements of psychic life, then there is the possibility of a group composed of proto-individuals: a We that is not a collection of I's. (p. 23)

Generally, Lear reserves the term "mass" for a collection of proto I's and the term "group" for a collection of true individuals or well-developed I's. The mass acts largely according to the principles of primary process activity. When a group of individuals collectively regresses to a less organized level of psychic functioning, it becomes an unthinking mass or, perhaps, a mob. In such a condition or state, individuals are unable to act and be affected both according to the demands of their own unique nature and the demands of the situation. The mass is driven by emotional and motivational states that are not fully developed. "Here irrationality is manifested in the mind's being insensitive or oversensitive, unresponsive or overresponsive to the world" (p. 50). The ruling emotional impulses of the mass are not integrated within any particular individual's conscious and coherent system of desire and belief, except (perhaps) within the mind of the mass's leader. Both in its proto-I parts and as a collective whole, the behavior of the mass is clearly impulsive. The internal pressure toward progressive development is

opposed by a regressive trend in such a situation. The behavior of the mass shows one way that the social environment can be a very disorganized but influential teacher. Because developmental trends are much more difficult to establish than regressive trends, formal systems of education, teaching methods, and various related social sciences have been given a significant role in the cultural construction of individuals. "That individuals exist depends on the social world nurturing their development" (p. 25). Within the mass, proto-individual behavior is regulated externally, whereas the nurturing environment activates and guides individual powers of development.

The development of an individual is not based on the formation of intrapsychic defensive structures but on caring guidance that nurtures intrapsychic integration. Intrapsychic defensive structures tend to produce impulsive behavior, whereas intrapsychic integration reorganizes primitive impulses according to secondary process forms of organization. Intelligent teachers, parents, and caregivers are essential for such development. Lear (1990) explains that "for an individual to come into existence, his archaic expression of subjectivity must be integrated into the rest of his life. An individual comes to be not by abolishing archaic life, but by taking it up into a higher level of organization" (p. 23). Instead of using rationality to fight or conquer one's own impulses, as Descartes proposes, rational or secondary process levels of psychic activity must learn to understand its archaic impulses in terms commensurable with the archaic. Instead of fighting these impulses as one would external forces, they are redirected, reformed, and developed. This can be a lifelong learning process. "Individuation is a process that begins at birth and can continue at even higher levels of development throughout life" (p. 21). The problem, however, is that the developmental "thrust toward self-understanding" can be "blocked by myriad inhibiting forces which freeze much of the mind's activity at archaic levels" (p. 8). Repression is the key inhibiting force. We can be tyrannized by repressed memories. Instead of consciously remembering a problematic or emotionally troubling past action or interpersonal interaction, the event is

chronically reenacted in a symptomatic form. A past experience is impulsively projected upon similar present situations. Resemblance, a largely--if not entirely--psychological determination, is the sole basis of generally transferring a past situation or present situations. Behavior thus proceeds according to a timeless principle that is largely isolated from reality testing.

Although the original impulse is not consciously recognized in its symptomatic form, it produces a powerful, repetitive effect. Referring to a famous case study, Lear (1990) asks,

> But why should memories tyrannize? Freud and Breuer suggest it is because the events of which they are memories were not lived properly. When Anna O. saw the dog drinking out of her glass she did not express her disgust because she wanted to be polite. That unexpressed disgust seemed to take up residence in her: and it became responsible for a generalized disgust of drinking. (p. 31)

Even when she was thirsty, Anna O. was physically unable to drink; the required muscle structures would not respond. It seems that "an appropriate emotional reaction was stifled because, to put it paradoxically, it was inappropriate" (p. 32). An uninhibited expression of the appropriate response, one of disgust, could be met with rejection and retaliation and thus be a threat to Anna O's sense of interpersonal security. Although her aversive visceral response is powerful and involuntary, her drive for interpersonal security may be equally or more powerful and involuntary. The appropriate "emotional reaction" is in conflict with a more valued social orientation. The repressed impulse consequently "persisted, unacknowledged, unaware, causing physical symptoms" (p. 32). The symptom is a concrete or non-discursive symbol that is related to the original impulse by resemblance based primary process activity. "An idea, even though repressed, may nevertheless have causal efficacy" (p. 89). The site of conflict is "within the person" (p. 32). There "seems to be a conflict between the person's emotional orientation and the demands that the person supposes the world to be making on her" (p. 32). The other

person, perhaps, might not be as easily and deeply offended by an appropriate response as Anna O. believes. If Anna O. had believed that the appropriate response would be accepted, then repression would not have inhibited the full development of that psychological state.

A wishful impulse and its corresponding feeling, according to Lear (1998), become a fully formed psychological state (or a desire and mature emotion) by being integrated with the mind's "rationalizing web of beliefs and expectations" (by means of its conscious system of propositional attitudes) (p. 82). Lear (1990) says,

> The concept of desire is that of a motivating force which, jointly with belief, produces action. There is no way into the concept of desire other than by the way it works in conjunction with belief to produce action. A wish occupies a different role. Like desire, a wish is a motivating force, but unlike desire, its products are not actions. (p. 75)

Wishes produce dreams during sleep and fantasies while awake. Because the motivating power of wishes is restricted to archaic or primary process activity, it cannot distinguish fantasy from reality. Lear says that the

> outcome of primary process activity is not an action designed to satisfy a wish, but a concrete, imagistic representation of the conditions that would satisfy it. In the case of an adult's dream this is not obvious, because the infantile wish causing the dream is repressed. (p. 77)

A wish can appear to have causal power for someone who is awake only insofar as reality is immediately responsive to the occurrence of a wishful impulse. "The reason we non omnipotent beings take belief into account is that the world is not immediately, magically submissive to our wills" (p. 73). A world that rigidly conforms to what we already know and want is a world with neither surprises nor vitality. In terms of possibilities for action or affordances, it would be quite an impoverished and insignificant place. As I argue in Chapter 4, the future states of the world cannot be encoded in a present state of the system. We know that we are connected to a world beyond ourselves because it is not

reducible to whatever we expect and wish for. Cognition of difference is transcendence of the immediate here and now of sensory experience.

Undeveloped wishes tend to produce symptomatic acts that disrupt goal-directed or meaningful actions. Such disruptions of intentionality, Leder (1990) says, produce a "spatiotemporal constriction" (p. 73). Attention is drawn back to the immediate here and now of one's own sensory experience and psychic states. Meaningful or functional actions must be distinguished from various anatomically reducible symptoms.

> It is precisely because we can see this action as an attempt to satisfy a desire, given certain beliefs, that we can see it as meaningful. And it is precisely this feature that makes us see an action *as an action*, rather than as a mere twitch or meaningless motion. (p. 72)

So a wishful impulse becomes a desire by being integrated with the belief and action systems. A developed emotion is "that which the idea would bring about if it could" (p. 88). As it becomes a fully formed psychological state, an emotion is transformed into a self effacing orientation to the world. One may, for instance, be pleased and joyous or displeased and sad about one's situation. Although a well-developed emotion is accompanied by its own specific aesthetic quality, it is about a state of the world rather than one's own psychic and organic states. One's own mature or fully developed psychological states are thus largely absent from experience. Immature impulses or states are a problematic presence in the field of cognition, whereby goal-directed action is impeded.

> The point of repression, for Freud, is to prevent this causal [developmental] story from unfolding. The so-called "wishful impulses" are ideas that in infancy would have caused pleasurable emotions, but now due to their conflict with conscious values and purposes, would cause unpleasurable feelings. These ideas are kept out of consciousness in order to inhibit the generation of this unpleasure. (p. 88)

The Oedipus complex provides a standard example of repression at work. Rycroft (1972) explains that the "complex is named after the mythical Oedipus who killed his father and married his mother without knowing they were his parents" (p. 118). While the literal

repetition of the oedipus myth necessarily produces tragedy, its creative, symbolic reenactment can lead to healthy character formation and development. At about 3 to 5 years of age a child has a sexual or loving impulse for the parent of the opposite sex and a corresponding jealousy, hatred, and wish for the death or disappearance of the same-sex parent. Hence, a 5-year-old son who wishes to be alone with his mother believes that he is the rival of his father. The complex is resolved by finally identifying with the same-sex parent and a "(partial) temporary renunciation of the parent of the opposite sex, who is "rediscovered" in his (her) adult sexual object" (p. 119). Identification is accompanied by internalization of a more general form of cultural law or authority. Before resolution occurs, Oedipal rivalry with the father produces "castration anxiety" (p. 119). In less theoretical terms, the boy has a generalized or ambiguously specified fear of the father's retaliation.

Lear (1990) discusses Freud's case study of Hans, a 5-year-old boy who suffers from a phobia or irrational fear that is rooted in repression. Hans's wish for the exclusive possession of his mother has been frustrated by his father, so he is angry at his father. His anger and hostile attitude causes him to fear his father's retaliation. Since neither his longing for his mother nor his anger at his father can be directed to their appropriate or intentional objects, both are transformed into anxiety. Lear (1990) says that there is

> a sense in which anxiety lacks conceptualization: it is fear of an unconceptualized object. And Freud, argues, anxiety naturally strives toward conceptualization; by its nature it tends to look for an object and thus transform itself into fear. . . . Because of its lack of direction there is no obvious defense against anxiety; but once anxiety has found an object and thus transformed itself into fear, it is possible for the person to take protective measures to avoid the fearful object. (p. 107)

Impulses are dispositions that continuously seek embodiment or embodied expression. Because their full development is a threat to the ego or the I, they emerge in symptomatic acts. Symptoms are responses to a range of objects that distantly and obscurely resemble

and thus symbolically represent the true intentional object of, say, fear, hate, and impulsive aversion or love and impulsive attraction.

Now, let us consider Hans's displaced or transferred fear of his father. Lear (1990) says that an interpsychic transference "involves a person's orientation to the world. Basically, a meaningful emotional response can be transferred onto seemingly inappropriate objects through a series of loose associations that characterize archaic mental activity" (p. 108). Interpsychic transferences are interpersonal transferences whereby the problematic significance of a person from the past is transferred to similar current figures. Here we begin to define"interpsychic transference" (p. 109). Interpsychic transference is "always the drawing of boundaries around a family of resemblances that cannot be fully contained within a concept" (p. 109). Also, "Freud shows that there is a realm of shared perceptions of similarity that tend to be overlooked by conscious thought" (p. 109). Hans's fear of horses was a symbolic substitute for his fear of his father. He lived in an environment where horses were commonplace. "Given this environmental accident, horses did offer him a suitable symbolic vehicle through which to channel his emotional life" (p. 108). Resemblances that appear superficial and insignificant to the principles of conceptual or secondary process thinking are nonetheless the basis of enduring and certain primary process associations. Like his father, "horses are big, and they have big widdlers" (p. 108). Widdlers, for Hans, is an ambiguous term that alternatively refers to the penis and excrement and, perhaps, his "bottom."

> Hans's first "horse" had been his father. Horses also bite. They can thus take revenge on a little boy for his oedipal wishes. . . . Hans went out for a walk with his mother one day and saw a big horse, drawing a bus, fall down. He no doubt associated to his father having fallen down, and perhaps feared the strength of his own oedipal wishes. (p. 108)

These are only a few of perhaps hundreds of associations that might have been explored and interpreted in the course of Hans's psychoanalytic therapy. They illustrate the kinds of associations that unconsciously and indissolubly link ideas together. Hans's father and

horses are both "big." Both have "big widdlers." Both can give a child a "horse" ride, "fall down," and take "revenge" (p. 19).

Two important psychological points are implied by Hans's fear of the "strength of his own oedipal wishes" (Lear, 1990, p. 19). First, insofar as parents are able to satisfy a young child's or infant's wishes without hesitation or frustration, the child, Rycroft (1972) explains, will believe that "thoughts themselves can alter the external world" (p. 119). This is called the "*omnipotence of thought*" (p. 119). While illusory omnipotence may be appropriate for early infancy, the reality principle should be acquired gradually with growth and development, by means of frustration and delayed satisfaction. Since Hans has not fully internalized the reality principle, he is worried that his hostile wishes will actually harm his father. Second, he is ambivalent about his father; he simultaneously loves and hates him. From Hans's fantasy-governed perspective he is a real threat to his father. He cannot consciously bear his fear of paternal retaliation. Unconscious processes do not provide a unified orientation. This can be explained in terms of the traditional model or the ecologically oriented, developmental model. Explaining further, Lear (1990) says,

> On Freud's scientific image, a fear of the father has been transferred onto horses. Repression consists in sundering the idea of the father and attaching the emotion to another object. On the developmental model, by contrast, that which would have resolved into fear of the father is prevented from doing so. Repression consists in inhibiting this process of resolution and in promoting the wrong sort of conceptualization. But it is not that the conscious idea of a horse is substituted for the unconscious idea of the father. Rather, for Hans's unconscious, there is no significant difference between fathers and horses. . . . Because of repression, the horse representations are differentiated out of a plethora of loose associations. (p. 109)

According to the "scientific image" or traditional epistemological dichotomy between the knower and the known object, unconscious wishes and feelings are fully formed psychological states. Unconscious psychic states are supposed to exist in their known organization and form antecedent to being known (by means of analysis and

interpretation). That is to say, interpretation does not involve creative processes but is exclusively a matter of discovery. An interpretation is therefore an isomorphic representation of an antecedently and independently existing psychic reality. Because the representation and the represented are mutually exclusive, the unconscious is the ego's other mind. The unconscious is supposedly known from the perspective of a passively receptive, detached spectator. Interpretation bridges an epistemological dichotomy between the conscious mind and the unconscious mind in order to restore function. Repression therefore implies that a fully formed emotion of fear has been transferred from an unconscious idea of the father to a conscious or fully formed idea of horses. Resolution of the phobia proceeds from the analyst's discovery and the analysand's acknowledgment of the idea that corresponds to the emotion's true intentional object.

From the developmental perspective, a phobic or impulsive emotion is, at most, an incompletely formed psychological state, while its supposedly conscious or fully formed idea can neither be well formed nor appropriately directed. For example, Hans's fear of his father is a consequence of the anger and hostility that he initially directs toward his father. He holds an unconfirmed belief that his attitude could provoke his father's retaliation or revenge. Instead, Hans expresses an impulsive fear of horses. But how could Hans *believe* that his previously neutral attitude toward horses could provoke revenge or retaliation? Consequently, Hans's phobic or irrational fear of horses is neither properly *oriented* nor *justified* in terms of belief and perception. Lear (1990) says that "anger" is "not merely a bodily response, it is *an orientation to the world*" (p 49). Explaining further, he says:

> But an emotion does more than orient the individual to the world: it comes packaged with its own *justification*. The little boy is angry *because* his father frustrates his wishes. This "because" provides not only a cause of the hostility, it also provides a reason for it. From the perspective of a little boy there could be no good reason to block his wishes: thus for him the frustration is an outrageous slight. (p. 50)

With neither proper orientation nor justification, an emotion cannot be fully developed. It cannot guide action or disclose the next impending phase of one's being. The "wrong sort of conceptualization" is constructed by means of symbolic resemblances that cause enough cognitive dissonance to protect conscious awareness from a threatening idea or impulse. Out of a possibly unlimited number of associations, only one that does not threaten the ego or the I becomes present to conscious awareness.

The key question for Lear (1990) is about how the mind knows or "recognizes" itself in diverse symptoms and symptomatic acts that may appear to be anything but mental activity or thought processes. The question is how the mind recognizes its own activity as it is

> expressed in dreams, in slips of the tongue, in symptomatic acts, in a paralyzed leg, a false pregnancy, in an irritable bowel. How does the mind recognize itself in, say, the act of vomiting? . . . How could vomiting itself by "thinking"? How could we recognize the mental in something so physical? (p. 7)

A good interpretation with an understanding of the particulars of one's own developmental processes makes recognition possible. Primary process activity uses non-discursive symbols or symptomatic acts to reenact past interpersonal interactions in which impulses were inhibited from achieving conscious expression because of repression. The symbolic reenactment may be endlessly repeated with no conscious recollection of the repressed event. The concept of identity formation should be helpful for explaining the nature of symbolic meaning. Identity is formed by taking in the structure of one's interpersonal world. Lear (1990) says that "I do not reflect the world, I devour it. The world I take in and re-create on the psychic stage is thus not the world as it is in itself, but the world as it has been psychologically metabolized by me" (p. 162). The vitality of this identification process is derived from "my fantasies as well as my perceptions" (p. 27). If one internalizes, say, an intolerable attitude of another person toward oneself but does not express one's disagreement directly in words, then one's

disagreement will be expressed in non-discursive symbolism. Material that cannot be transformed into a form that is agreeable to oneself produces an insoluble intrapsychic conflict; it is psychically poisonous and may be symbolically externalized. The oral metaphor of psychically taking in the world may be reversed in a literal form such as vomiting. Vomiting thus expresses a thought. In a more obvious, standard example, a therapist tells a patient: "You have an incest wish for your father." The patient's denial expresses the repressed wish when she says, "Poppycock."

The next question is about the epistemological status of an interpretation and how we know that a symptom has a psychological cause, in contrast to an organic cause. Recognition is the key. Lear (1990) explains:

> The answer lies in the fact that recognition tends to have a *transformative effect*. An interpretation attempts to elucidate the content of the archaic mental activity by expressing it in terms of higher level thinking with which we are familiar. But this interpretation not only explicates the primitive mental activity, it can transform it. It is as though the archaic "thinking" is an early stage of development process en route toward expression in terms of concepts and judgements. . . . *It is the responsiveness of this archaic mental activity to the mind's own attempt to understand it that lends credibility to the idea that what we have here is a form of mental functioning*. (p. 7, italics added)

If the cause of a symptom were largely or entirely organic, it might respond to medical treatment, but not to recognition. But when a symptom responds to recognition through transformation and its permanent disappearance, we know that the symptom has a psychological cause and is a non-discursive, symbolic representation of a repressed idea. Self-knowledge or self-recognition is possible only when interpretation is accompanied by self-understanding. In therapy one shapes and develops one's archaic impulses or drives by progressively integrating them with progressively higher order concepts or higher levels of psychic organization. Understanding implies a progression from simpler to more complex forms of intrapsychic conceptualization and organization. Basically, one begins to conceptualize undeveloped impulses at the rate of one unconscious image or

affect at a time and progressively includes more and more unconscious material into progressively more principled and inclusive conceptualized themes. Conceptual thought is thereby able to integrate unconscious material into a coherent and holistic self-narrative. Understanding resides in the discerning discovery and creative transformation of the many particulars of one's own developmental history. The integration of primary process activity into goal directed secondary process activity is analogous to the goal-specified and perceptually controlled organization of muscles into functional groupings or coordinative structures. In both cases, organic processes are brought to terms with goals and perceptual information. Consequently, the idea of abolishing or fighting primitive impulses instead of reorganizing and developing them is analogous to fighting or eliminating muscle activity instead of developing coordination and dexterity. One might say that in the course of uncoordinated action various muscle groups have "disparate orientations to the world" (p. 93).Lear says that "the unconscious is of course not itself a unified orientation. The child may unconsciously love as well as hate the same person. The unconscious, then, is the home of disparate orientations to the world" (p. 93). Interpretation thus coordinates disparate orientations into a unified goal-orientation. Lear explains:

> An interpretation brings together what had, until interpretation, seemed like diverse phenomena: it raises them to a new unity and allows the person to move forward in ways that would not have been possible before the interpretation. . . . For the interpretation not only makes sense of the phenomena, it is itself the product and completion of them. (p. 12)

In contrast to the classical model, the developmental model shows that self-knowledge or recognition actively engages the object it knows. The mind does not interpret and construct truthful inner perceptions from the ambiguous or disorganized appearances of an external world; instead, the mind interprets and constructs a self-representation from disorganized or ambiguously organized primary process activity.

Transformation of the content of unconscious processes confirms the truth of our interpretation. Lear (1990) describes such a transformation as a function of Hans's therapeutic process:

> He is not just finding the proper concepts to apply to the emotional "objects" in his life; the emotional objects are acquiring their own conceptualization. For this to be possible, Hans must transform the emotional relation in which he stands to his own wishes. He no longer fears his oedipal wishes; he can acknowledge and accept them. This allows the wishes themselves to develop in form and content: that is to move in the direction of becoming desires. This in turn allows the proto-emotions of the unconscious to develop into emotions. The transformations of Hans's emotional life and the transformation of Hans's understanding are of a piece. (p. 112)

Insofar as the conceptualization or interpretation of the demands of one's own proto emotions and proto-desires or wishes are supported by understanding, both conceptual thought and drive activity are transformed. While conceptual thought forms, directs, and organizes archaic emotional and motivational states, those archaic processes provide conceptual thought or the thinking I with its own unique living substance. Undeveloped drives are a constellation or collection of native dispositions or abilities to act and be affected in particular ways and are structured in an ambiguous but uniquely configured form. Agency that operates at a higher level of organization can empower the drives and therefore the individual by shaping and directing them both according to the demands of their own native characteristics and the demands of cultural, social, and moral principles. That is to say, habits of acting and being affected can be intelligently shaped and directed by a sufficiently well organized individual who actively cares and recognizes the requirements of the individually and collectively determined poles of character formation. Parents, teachers, and therapists should be among those with such abilities. So Hans must learn not to fear but to recognize and develop his own angry and loving impulses.

Hans, on the one hand, is disposed to assume that the interpersonal world is magically submissive to his wishful impulses, while, on the other hand, he assumes that

his father is angry and ready to retaliate and has no regard whatsoever for his wishes. His wishes are either omnipotent or completely impotent. Such are the polarized or contradictory tendencies of primary process activity. His therapist must help to activate and direct the integrative powers of the thinking I or ego in order to mediate between the demands of internal impulses and the external world. The coherently organized development of archaic impulses depends on integrating or unifying them with the thinking I's conscious system of beliefs, expectations, and justifications. Impulses must be brought to terms with reality testing. Hans must learn his own locus of control through goal-directed action that proceeds according to cultural and natural laws. Since his emotional attachment for his mother does not produce actions that function at a level of physiological and psychological organization that could threaten or make his father jealous, the two cannot be serious rivals. Hans's impulsive longing or loving attraction for his mother should be directed and formed according to culturally and morally approved patterns of acting, feeling, and interpersonal relating. A 5-year-old's sexual longings or loving impulses eventually find their object as an adult, hopefully in terms of mutual recognition between well-organized and independent subjects. The child must also learn that his death wish for his father also lacks adequate conceptual organization. Death, for a child, may not be clearly distinguished from merely going away for a while or temporary disappearances or absences. Lear (1990) explains that

> the infantile wish differs in content from what would be the content of the corresponding adult desire. For the desire would have absorbed into its content a richer conception of what is for a person to be dead. Thus in spite of his theory, Freud distinguishes a wish from a desire not by their differing aims, but by the inchoate content of the wish. (p. 84)

The death wish eventually finds a symbolic expression through separation from the father and the formation of independent and unique personal identity. The literal killing of the father and marrying of the mother, of course, would be a tragic path to independence and identity formation. Infantile impulses are therefore not necessarily evil impulses that must

be abolished but immature or ambiguously structured volitional dispositions that must be given culturally informed, intelligent direction.

Once Freud recognizes that Hans's own fantasies have become adequately integrated with conceptual processes so that Hans is able to understand his conflict, Freud offers the boy a fully conceptualized interpretation. The same interpretation without adequate understanding would be received defensively, without recognition. Repression would remain. Freud says that

> I disclosed to him that he was afraid of his father, precisely because he was so fond of his mother. It must be, I told him, that he thought his father was angry with him on that account; but this was not so, his father was fond of him in spite of it, and he might admit everything without any fear. (Lear, 1990, p. 110)

Once the archaic impulse is fully integrated with secondary process thought, the phobic or irrational impulse disappears and appears as a fully formed psychological state that is immune from repression. From the perspective of the concept of the structure of lived embodiment, an irrational fear or impulse emerges in the field of action and perception as a problematic, world-concealing presence that, like an organic symptom, requires interpretation. As the impulse is progressively integrated with higher levels of psychic organization, it acquires the self-effacing transitivity of a fully formed and world-disclosive psychological state. An individual's functioning and perceptual connection to the world are thereby restored.

There is a significant difference between how the classical image of detached and passively receptive knowing and how the dynamic developmental perspective conceptualize the success of analysis. Lear (1990) says,

> On the classical conception, the success of the analysis is due to the undoing of repression of the infantile wish. But there is also a transformation in the content of the wish: The father-horse is no longer feared in part because his fantasied role has been transformed into one in which he no longer has any reason to seek revenge. The analytic interpretation, therefore, not only

> provides concepts for the archaic productions; it helps to shape the course of those productions. (p. 117)

According to the classical conception of psychic functioning, a quantity of energy that is associated with a fully formed idea of the father seeks discharge in connection with its intentional object or idea, but repression inhibits that discharge of energy in the form of the threatening idea. An internalized prohibition determines that threatening ideas are distorted beyond recognition. Repression ensures that energy is associated with and structured according to the wrong idea, whereby it is discharged through intentionality disrupting, chronic symptoms. Internalized moral authority appears as an opponent of an embodied impulse. The mind is thus said to oppose the body. On the development model, however, analytical interpretation reorganizes and structures that archaically organized energy until it can be integrated with coherent and conscious character organization. Interpretation unequivocally structures the energy of the impulse so that it becomes functional or able to construct goal-direction action. Contradictory, polarized, or ambiguously structured motivational and emotional states are transformed and reconstructed by means of a combination of interpretation and understanding that is organized according to principles that are based on propositional forms of communication or discursive symbols. The "loose associations" of archaic processes provides content for interpretation. "The meaning of the infantile wish," Lear says, "is grounded both in the loose associations of archaic mind and in the analytic interpretation that completes the development of the wish it renders intelligible" (p. 119).

The key instrument for shaping and organizing archaic impulses or archaic emotional and motivational states is language, the use of discursive symbols to organize non-discursive symbolic activity. The unconscious web of associations that masks or disguises latent or repressed ideas with manifest content, ideas, or appearances is integrated with the web of belief and propositional attitudes by means of propositions.

Language is essential for shaping, developing, and organizing otherwise disorganized ideas or images. Lear (1990) says,

> What Freud and Breuer seem to describe as therapeutic is a conscious unification of thought and feeling. For what is meant by "putting an emotion into words" is a unification of a conscious appreciation of a significant past experience with an emotional response that for them is a genuine response. (p. 33)

One must recall the repressed event or idea and associate it with its appropriate emotional response. Lear emphasizes that the patient *must "put the emotion into words*" (p. 33). Repressed impulses tend to produce chronic symptoms until they are expressed in words. Freud and Breuer explain further:

> We found, to our great surprise at first, that *each individual hysterical symptom immediately and permanently disappeared when we had succeeded in bringing clearly to light the memory of the event by which it was provoked and in arousing its accompanying emotion, and when the patient had described that event in the greatest possible detail and had put the emotion into words*. Recollection without emotion almost invariably produces no result. (Lear, 1990, p. 33)

The individual can, in a sense, re-live the event with an appropriate response that is true both to the self and to the situation. The event is reenacted according to the direction of a higher level of unity or organization so that the response or how the individual acts and is affected can be intelligently shaped according to both internal and external demands. The appearances of the inner world of primary process thought, not the appearances of the perceptual world, are a source of ambiguity that requires corrective interpretation. Recall that the "way repression is able to keep a thought unconscious is by preventing it from developing into a fully fledged thought" (p. 105). Conscious recollection of the disruptive past event with its proper emotion and explicit description causes the transformation and complete development of a thought and affect. One can respond to a genuinely disgusting event with disgust, a genuinely dangerous event with fear, or a truly caring interpersonal

situation with reciprocity. Lear refers to this process as "*intra*psychic transference" (p. 105, italics added). Lear elaborates:

> The concrete, imagistic unconscious represents the thing. *For a thought to become conscious, the thing representation must be linked with an appropriate word-representation.* Freud called this process of linking "transference." Basically the energy attaching to the unconscious idea--an archaic thing representation--is transferred onto the secondary-process concept. The unconscious or preconscious thought thus acquires an "undeserved degree of intensity." (p. 105, italics added)

Lear, explaining further, says that our "*intrapsychic transference*" is a transference "*within the mind*" (p. 105).

The energy that is transferred from primary to secondary process ideas, as I have been arguing, may be fruitfully conceived as archaically structured motivational and emotional energy that is restructured or reorganized according to goal-directed, secondary process ideas. That is to say, energy that is structured according to the highly ambiguous or the widely varying meanings of archaic forms of organization is reorganized according to the unequivocally structured and constant meanings of conscious, goal-directed forms of organization. Recall that an irrational impulse can be a kind of overgeneralization based on some disturbing past experience. Anna O. personifies the principles of associationism. Detection of invariant meaning-structures is displaced by psychological or symbolic resemblances. The past is indiscriminately projected upon or transferred to similar current situations. Reconnecting the emotion with the right idea grounds the emotion the world of action and perception. The fully developed emotion is therefore an ecologically sound or self-effacing, world disclosive psychological state, in contrast to an incompletely formed, world concealing impulse. Intrapsychic transference is

> the incorporation of a concept at the level of both word and thing. The word expresses the concept, and the concept and things have been linked together. This is the development of higher psychical organization: an organization

> that is occurring equally at archaic and higher levels of mental activity. (p. 107)

Archaic activity and early memories are not eliminated or left behind but are incorporated into higher levels of psychic organization. Symbolic convention thereby expresses the vitality of the unique living animate organism.

A change in one's orientation or attitude toward one's emotion is required for the emotion's full development. *Reenactment* of an original frustration or traumatic event while developing a proper orientation toward one's own dispositions to act and feel is an important function of the therapeutic situation. Lear (1990) says that

> this transformation of one's orientation to a repressed emotion is often facilitated by a reenactment of it. It is this mimetic aspect to the orientation that Freud took to be a discharge. In fact, it seems that the emotion needs to be rippling archaically through the person if he is to grasp it consciously. The reenactment seems to be needed for the hitherto repressed emotion to complete its process of development: to move from archaic expression toward acquiring a concept with which it can be understood. Here it is not just that a distinctly existing emotion can finally be understood; the understanding helps to constitute the emotion. The conceptualization of an emotion is a development of the emotion itself. It is this development that allows one to transform one's relation to it. (p. 68)

In terms of the structure of lived embodiment, the change in orientation or attitude to one's own archaic impulses and emotional states is a shift from passively suffering their operation from a third person-like or external perspective to actively operating or acting in unity with those impulses insofar as they are well developed. To the extent that they are fully developed, motivational states are absent from and functionally unified with the first person perspective. The purpose of reenactment is to *intelligently inform* an impulse and its emotion while it is being experienced in its full depth and intensity. The purported experience of a discharge of a quantity of energy is what inspires Freud's classical, mechanistic, or anatomically reductive concept of mind. The cathartic effect is therefore conceptualized as the discharge of a large quantity of motivational energy and the consequential experience of relief. One is said to feel a release of instinctual tension or,

more precisely, drive tension. But this is the purely quantitative interpretation of emotion and desire and is probably based on the intensely felt and aesthetically pleasing quality of the cathartic experience. Although aesthetic quality and energy discharge may be essential for catharsis, they are essential for a wide range of cognitive and affective activities and therefore do not unequivocally specify a cathartic mode of activity. Lear explains that "the relief that is experienced when one is at least able to emotionally experience one's thoughts -the relief that is so naturally, if mistakenly, conceived as discharge--suggests that there is a natural satisfaction in overcoming the divorce between thought and appropriate feeling" (p. 46). Satisfaction and a sense of well-being is produced by the development and healthy functioning of one's own powers of acting and being affected.

An uninformed release of anxious tension is a discharge of an ambiguously qualified or structured quantity of energy. Locomotor activity, at best, equivocally specifies the proper course of action and perception. One may be said to "let off some steam," "vent one's emotions," "blow one's top," "explode," "go ballistic," go into a fit or rage, or simply exert and exhaust oneself with vigorous exercise. All of these techniques may afford temporary relief from anxiety or anxious tension. But because none of them have an appropriate or specific object, they are largely--if not entirely--uninformed discharges. Hysterical symptoms produce energy discharges but little or no relief or can even make things worse. Vigorous exercise may be quite effective since anxiety may be *temporarily* resolved through physical exhaustion. Lear (1990) says that "hysterical phobias and transferences of emotion onto the analyst involve great 'discharges' of emotion, albeit onto inappropriate objects, and they do not provide relief" (p. 47). With a hysterical transference a patient might respond to the therapist as if the therapist were his or her father. A hysteric may indiscriminately and unreflectively transfer the undeveloped emotional-intent of a specific and problematic past experience onto a resembling present experiences. Perceptual control of action is largely--if not

entirely--displaced by the associations formed by archaic forms of psychic organization. Recall Hans who shows an irrational fear of horses generally while his father-horse idea was the true source of the illusory threat. Lear argues that there must be a "qualitative factor" in catharsis (p. 153). The qualitative factor is a change or transformation of one's orientation toward one's own organic or instinctual life and a consequential change in one's attitude or orientation toward the interpersonal world. *Perception is restored to control of action.* In Lear's (1990) words, "What is crucial to Freud's practice of catharsis, as opposed to his [mechanistic] theory is not the discharge of energy, but rather a person's coming to experience his own desires and fears consciously and with appropriate emotional intensity" (p. 45). The *quantity* of energy that is transformed into cycles of locomotion or goal-directed activity is a *qualitative* determination. Until the fully formed emotion is directed to the right object at the right intensity and length of time it remains a primitive, chronic symptom that, at best, provides temporary relief and, at worst, is a painful imposition or cause of suffering. "Why is it that only the *genuine* emotional response directed onto the right object is successful in discharging the pent-up psychic energy" (p. 45)? Why does truth have a "therapeutic" or curative effect? Lear's answer is that "a person can obtain relief from hysterical symptoms by honestly experiencing his own emotions" (p. 45). Acting and being affected according to one's own native capacities and to what the world requires produces a sense of well being. This requires development. In therapy the sufferer of chronic symptoms must be shown to have "an inadequate understanding of who he is, what happened to him and how he feels about it "(p. 45). Catharsis is "a conscious unification of thought and feeling" that causes the disappearance of symptoms and the restoration of function and meaning.

According to Lear, therapy reproduces the kind of developmental conditions from which the I originally emerged in order to reenact a trauma-inducing situation according to a higher level of psychic organization. That is to say, one must do the same thing again only in a manner that intelligently informs or develops emotions and motivational states

that have previously been isolated from developmental processes. Therapy thereby facilitates individuation. One becomes immersed in the relatively disorganized, and perhaps disturbing, vitality of one's own organic impulses or drives without the protective mediation of defensive symbols. Lear (1990) says that

> analysis is a symphony of regression and reorganization: in regression the analysand strongly experiences his instinctual life; in reorganization he acquires the concept with which that life can be understood. The analytic interpretation which offers the concepts is, in its way, a loving response to the experienced instinctual life, and the it's [the drives] response to that responsiveness is to infuse those concepts with life and vigor. In the melody of regression, interpretation and reorganization there is a re-creation in miniature of the drama from which the I emerged. (p. 180)

During regression one undergoes an experience similar to that of just waking up from a fairly deep sleep and being in a disoriented and disorganized state, precisely the condition in which reorganization and redirection can be most effective. The patient internalizes and identifies with the higher level of organization afforded by the therapist. The internalized form of organization is incorporated or integrated with the patient's general character organization as an enduring psychological state.

The individuation process begins during infancy with primitive drive satisfaction. Individuation is a process by which one becomes aware of oneself as a differentiated-unity. This process depends on internalization, identification,and incorporation. Rycroft (1995) explains that individuation is

> the process of becoming an individual or becoming aware that one is one. As used by Jung [and Lear and Benjamin], the term seems to include not only becoming aware one is separate and different from others, but also the idea that one is oneself a whole, indivisible person. (p. 80)

Internalization means that the external or interpersonal world is recreated internally or in the form of intrapsychic structure. One permanently internalizes functions of other persons in one's own psychic structure. For example, we internalize the imperatives and prohibitions of our parents and teachers and consequently learn to autonomously direct

our own behavior. We learn to do for ourselves not only *what* others did for us but do it *how* they did it. We become like them. According to Laplanche and Pontalis (1973) identification is a

> psychological process whereby the subject assimilates an aspect, property or attribute of the other and is transformed, wholly or partially, after the model the other provides. It is by means of a series of identifications that the personality is constituted and specified. (p. 205)

In behavioral terms we recreate the patterns of acting and being affected of another in our own behavior whereby the self is durably transformed in whole or part. Such transformations are shaped and organized according to an individual's own unique temperament. Because identification is a largely primary process activity, it depends on "incorporation." Lear (1990) says that "while feeding at the breast consists in physical incorporation of nourishment, the sexual activity consists in the psychological incorporation of the sexual object" (p. 129). That is to say, organic nourishment is accompanied by psychological nourishment. The infant internalizes the mother's higher level of psychic organization with respect to soothing and comforting functions. The mother regulates the infant's emotional states and thereby activates the infant's own self-soothing and comforting functioning.

Benjamin (1988) is careful to point out the mutually active and responsive character of the mother-infant relationship. The infant's autonomous capacity for regular emotional functioning is activated by the mother. She explains that "the ability to sooth oneself is *not* generated by *internalizing* the other's function; it is a capacity of the self which the other's response helps to activate" (p. 44, italics added). The emphasis here is on the "presence of two interacting subjects who each contribute, rather than one subject who incorporates the action of the object" (p. 45). Benjamin's use of "internalization" here is equivalent to Lear's (1990) idea of "archaic identification" (p. 199). "The identification is archaic in the sense that instead of taking in some perceived quality of a loved one, the person identifies by suspending the boundary between self and other. He is

other and the other is he (p. 199). Two persons are cognitively individuated or differentiated, but emotionally and motivationally they form an undifferentiated-unity or dual-unity. One is an inverted mirror image of the other. Psychically speaking, there is only one active and passive subject, one person emphasizing passivity and the other activity. Only autonomous or independent subjects, who form a functionally integrated balance of active and passive qualities, can present perceivable and functional combinations of psychic qualities that afford internalization processes. Hence, only an autonomous or functionally separate mother can afford her infant an opportunity for the formation and development of autonomous powers of emotional self-regulation. Lear (1990) says,

> Thumb-sucking is an infantile attempt to recreate the pleasurable situation of being at the breast. . . . Thumb-sucking cannot be occurring for the purpose of self-preservation. The aim of the re-creation must differ from the aim of the prototypical act. One of the virtues of thumb-sucking is that the child, as it were, compensates himself for the independence and repeated absence of the maternal breast. (p. 128)

The activation, internalization, and enduring incorporation of maternal psychic functioning is the infant's compensation for separation and loss. Incorporation activates the identity formation process, that is, the development of an independent, unique, and enduring state of character organization and corresponding forms of interpersonal relating. Incorporation processes create symbolic substitutions for the psychic functioning of absent loving and loved figures. An infant thereby acquires the autonomous ability to regulate his or her own emotional and motivational states in a process that is the *psychological* birth of the infant. The infant's thumb is a non-discursive symbol for the breast and maternal functioning. "Psychic structure," Lear says, "is created by a dialectic of love and loss. The structure of the mind is an inner re-creation of the structure of the loved world" (p. 160). While identification is a re-creating of the patterns of acting and

being affected that are recognized in the behavior of another individual, the ego or the I mediates the process. Identification is a

> psychological act. It is not merely a physiological process by which I come to passively resemble my environment, as though I were a piece of film exposed to the light of the external world. I do not reflect the world, I devour it. The world I take in and re-create on the psychic stage is thus not the world as it is in itself, but the world as it has been psychologically metabolized by me. . . . In this sense, the I is an interpretation: I become what I take the world to be. (p. 162)

Development is a function of both the native temperament and capacities and the nurturing environment.

According to Lear, developmental processes and the emergence of a self-conscious I are a function of a force called love. "Love" Lear (1990) says, "is an inner force for development" (p. 155). Love is an emotional orientation to the world and is expressed in both progressive and regressive tendencies. Recall that the self is constructed from a succession of past identifications and that each new love object resembles earlier objects of love and identification.

> In this sense, love is historically minded, and that the unity a person is thereby impelled to seek is with his own past. Given the nature of human development, the pressure to restore must be the pressure to regress: to move back to a less differentiated psychological organization. (p. 149)

Since internalization and memory function at an archaic level of organization, regression is essential for developmental processes. But internalization cannot proceed during regression to the level of archaic identification or undifferentiated unity. Internalization of the functioning of another is possible only insofar as an autonomous I or ego is disclosed. The I and its higher levels of developmental unity disappear during archaic identification. Although episodes of regression are necessary for developmental processes, they must be limited. "Love" also "pulls in the opposite direction. It fuels human development and pulls us toward higher, more differentiated unities" (p. 150). Development therefore implies an alternation between regressive and progressive

tendencies with an overall emphasis on progression and differentiation. Although there is "an ever-present tendency to regress toward undifferentiated unity," "love's nature is to pull us toward ever more complex unities" (p. 199). Love is a developmental force insofar as one is attracted to more organized forms of organization. "Disorganized love," Lear says,

> is doing more than seeking satisfaction or tending toward discharge. It is attracted to organized love which responds to its needs, it takes in that love by the fantasied act of identification, and so becomes organized. It is in this sense that the world is an occasion for the satisfaction and development of the drives, not just a recipient of discharges. (p. 170)

Well-organized love affords disorganized love a higher level of organization or developmental unity.

Although it is better for an individual to take in the well-organized love of a responsive or nurturing interpersonal world, the poorly organized or disorganized love of an unresponsive world also may be unreflectively internalized. Lear (1990) explains that the identification process can be detected through careful listening.

> The inner world toward which we are emotionally oriented is, Freud discovered, a re-creation of the outer world. . . . If one listens carefully, one would find that melancholics' self-reproaches fit someone else. Somehow, reproaches that would have accurately been directed against the love done have been redirected onto the accuser. . . . In his clinical work Freud repeatedly noticed that melancholics had taken on personality traits, mannerisms, aspects of character of their love objects. So, to take an exaggerated but plausible example, a melancholic might berate himself for stinginess, but in the course of doing a family history it would emerge that his father had been stingy. The reproaches had become self-reproaches . . . Because the lover had psychologically taken the loved one into himself. The loved one was now part of the melancholic's own I. (p. 159)

The individual comes to be "via fantasied acts of identification" (p. 178). According to Freud, "the character of the I is a precipitate of abandoned object-investments and that it contains the history of those choices" (p. 164). Experiences of separation from loved and loving figures are necessary for development.

> This helps to constitute psychic structure sufficiently rich to enable a person to care about himself. The creation of the individual and the caring for the individual are of a piece. For it is only with the internalization of these caring relationships that there emerges a creature sufficiently reflective and self aware to deserve the title of "individual." (p. 187)

With each separation and loss and consequential disappointment there is an alteration or transformation in the ego or the I. Libidinal energy is thereby transformed into psychic structure. Healthy development means that each alteration produces a higher level of psychic organization or integrity.

Only because our wishes are frustrated and we become separated from and eventually lose loved and loving others do we form independently existing and unified personal identities. From the perspective of such a differentiated unity one can be aware of oneself as a unique and independent locus of control and desire. Only from such a perspective is one able to recognize another as a unique and independent locus of power and desire. Otherwise, we are disposed to become locked in a quasi-solipsistic world of interpersonal representations or fantastic projections. Lear (1990) explains:

> Freud insisted that a developing infant must experience frustration if he is ever to perceive an independently existing world. It is from the disappointment that the breast cannot forever magically meet the infant's wishful lips that the infant begins to differential himself from the world. And it is through all the frustrating descendants of this primal frustration that the world comes to have psychological reality for him. *A necessary condition for there being a world for this person is that it be a world that is not immediately responsive to his wishes.* And so one might say that of the world that it could never be better than good enough. (p. 158, italics added)

In a good enough world separations are neither too frequent nor too long, while frustrations are neither too difficult nor too frequent. As infants mature and develop powers of emotional self-regulation, they can reliably handle more difficult and frequent frustrations, while separations can be handled in spite of being more frequent and longer in duration. The other side of the good-enough world is that it does frustrate and impose separation upon the infant. In a perfect or ideal world the infant would never internalize the higher levels of organization offered by caring adults. Neither the I nor the I's ability

to regulate its own emotions would emerge. An external world or interpersonal world that lies beyond the self would never emerge for the infant. The infant would become imprisoned within its own internal representations. The key is that we are able to internalize what another person does for us so that upon separation we acquire an enduring ability to do it for ourselves.

This process is especially well known with respect to the internalization of moral and cultural authority. We must either learn to rule ourselves or be ruled by others. Recall the recurring theme in this chapter: we must learn or develop and form habits of being affected according both to the demands of our own native temperament and dispositions and to the demands of cultural, moral, and natural law. Thus far the emphasis has been on drives or the inner pole of development. Now let us shift the emphasis to the opposite pole. Lear (1990) explains the internalization of the super-I or super ego:

> In the early stages of development, a child's ideals and norms do not seem to be located in him at all. They are *over there*, operating in his parents and the cultural environment. It is the parents' utterances of values, prohibitions and norms that have efficacy for the child. It is the internalization of those values, their active operation within the individual psyche, that helps to constitute an individual mind. But once values and norms have been firmly internalized, and there now exists within the child a structured super-I, the task of making the super-I one's own can be readdressed at a higher level. . . . [T]he distinctive task of adolescence is to effect a transformation by which one's values and norms are no longer direct internalization of parental norms, but have somehow been mediated in such a way as to make them distinctive and expressive of the emerging adult. (p. 205)

The super-I is known largely for the pathologies that arise when it is not fully integrated with overall character organization. Recall the example of the melancholic who incorporated the conflicted characteristics of a lost love-object into the organization of his own I or ego. Freud draws a conclusion:

> Thus the shadow of the object fell upon the I, and the latter could henceforth be judged by a special agency, as though it were an object, the forsaken object. In this way an object-loss was transformed into an I-loss, and the conflict between the I and the loved person into a cleavage between the critical activity of the I and the I as altered by the identification. (p. 160)

Here the individual has taken in the organization of the lost object as possible compensation for the loss and disappointment. "Instead of displacing his love onto another person, the melancholic withdrew his love *and his loved one* into himself" (p. 160). The loved other is re-created in psychic structure. The punishing other is now a permanent function of the melancholic's own psychic structure.

The problem is when the felt cleavage between the critical activity of the I and the I as transformed by identification is not resolved. Internalized standards for behavior or critical functioning are not made one's own, that is to say, critical activity is not fully integrated with the functional organization of the I or ego. Consequently, the I encounters its own internalized moral dispositions as problematic presences or thematic objects of awareness in its own cognitive field. Unconscious guilt is therefore a mode of bodily dys-appearance. For instance, Lear (1990) says that with

> unconscious guilt . . . The ideal-I or super-I must split off from the I, set over against it, *holding* the I responsible for unconscious drives. And the I, for its part, denies responsibility by repressing the drives. This denial the super-I blithely ignores. We thus have a war of separation in the soul. (p. 174)

The resolution of the internalized punishment of unconscious guilt is to develop the drives both according to one's own unique nature and in a morally and culturally approved direction and form. Since the actual separation from or permanent loss of one's same sex parent and the actual formation of an independent or separate identity are a symbolic descendant of the infantile death wish for that parent, they are transformations of that early wish. But for the unconscious, separation and death are essentially equivalent. Forming an autonomous and unique identity is thus equivalent to killing one's mother or father. But guilt keeps the parent alive for the child. As a result, unconscious guilt may be felt in the disruptive episodes of coercively felt imperatives and punishing prohibitions. Internalized standards are still felt as *over there* or external. Resolution implies that the I organizes and develops the demands of the drives and those of the

external or interpersonal world into a well-formed and coherently organized action and perception system. Internalized cultural and moral principles or laws are the invariant meaning-structures that afford the full formation and development and unique expression of an individual's native emotional and motivational states. The I is, to some extent, a living interpretation of the lost parent. Continuity without punishment is preserved in creatively reproduced patterns of behavior.

As the drives and internalized cultural and moral values and standards are made one's own, they become functionally unified with the goal-directed, first-person perspective of the I or ego. There is also a shift in our conceptual perspective. The behavior of a person who operates according to internalized and coercive critical impulses is analogous to the motor system of traditional psychology that is regulated by extra-systematic intelligence. Both imply competition between separate agencies, one unintelligent and uninformed and the other intelligent and informed. But as we have seen, primitive emotions and motivational states are forms of thought or intelligence that require direction from a more organized level of intelligence. Intelligence or the capacity for thinking is always incarnate in the living body. Of course, when the I encounters its own activity in the form of unruly impulses or psychic tropisms, continuity is not so obvious. Lear (1990) says that

> archaic mental functioning knows no firm boundary between mind and body, and so archaic mind is incarnate in the body. Although fantasies may be expressed in images [dreams], they may also occur in paralyses, vomiting, skin irritations, spasms, ulcers, etc.; and even by being dramatically acted out by the person whose fantasy it is. (p. 38)

From these disruptive modes of activity, the mind-body dichotomy may be a tempting inference. But as the I interprets, understands, and thereby reorganizes, forms, and directs symptomatic impulses, the two become functionally unified. The illusory dichotomy disappears. Developed motivational and emotional states are unified with the first person perspective of the I. The I thereby functionally incarnates its own archaic psychological

states or body. Now the more appropriate conceptualization is not the externally controlled motor system but the self-organizing features of the action and perception system. Intelligence operates within and throughout the system. Episodes of functional disunity do not warrant a general ontological inference of a mind-body dichotomy. As the drives and cultural and moral values are made one's own, they become functionally unified with the I and disappear from the first person perspective.

Lear (1990) cautions his readers not to infer ontologically distinct agencies within the soul based on the structure of incomplete super-I incorporation. Lear explains:

> But before concluding that the soul does have parts, one ought to consider that this configuration is a manifestation of illness. When we inquire into the transition from sickness to health, the "parts" of the soul lose their "partness." There is a transition from the third-personal stance of holding oneself responsible for one's drives to the first-personal stance of accepting responsibility for them. The Super-I is no longer set over against the I, but has taken up a more benign residence within the I, an intrapsychic embodiment of value. Freud captured both sides well when he called the ideal-I "a *differentiating* grade in the I." One might say that the super-I has been domesticated into an ideal-I. (p. 175)

This passage raises two important but distinct issues. The first involves two modes of responsibility that lie at opposite poles of embodied experience, and the second is about a transformation in the structure of the I that accompanies ownership of cultural and moral values or standards.

Lear distinguishes between *holding* oneself responsible for one's drives and accepting responsibility for one's drives. Lear (1990) says that "the emotional transformation inherent in catharsis is intimately bound up with the type of responsibility one takes for one's own emotions" (p. 65). By holding ourselves responsible we are said to "reign in" our unruly impulses. The implicit idea is that of restraining or fighting and conquering an urge or impulse that lies beyond the scope of voluntary movement and understanding. Explaining further, Lear says:

> The attitude of h*olding someone responsible* is one that one can take toward oneself or others. In holding oneself responsible one is essentially taking a third-personal stance with respect to oneself and deciding whether one's character, action, thoughts or feelings are worthy of praise or blame. It is because she would have held herself responsible, blamed herself, for her love, that Elisabeth Von R. archaically denied responsibility via repression. But as she is able to cease *holding* herself responsible for her emotions, she is able to *accept* responsibility for them: that is she is able to acknowledge them as hers. Accepting responsibility is essentially a first-person relation. In accepting responsibility I acknowledge who or what I am. (p. 66)

Elisabeth Von R. was "in love with" her "brother-in-law" (p. 61). Her hysterical symptoms were "pains in the legs" and "difficulty in walking" (p. 56). Therapeutic success or catharsis is a function of "bringing forth the repressed idea with its appropriate emotion" (p. 58). She found her longing for her brother-in-law too terrible to consciously contemplate. Freud encourages her to abandon the hysterical orientation or attitude toward the idea and to reconceptualize the idea with "sympathy and distance" (p. 58). For instance, Freud tells Elisabeth Von R. that "*we are not responsible for our feelings and that her behavior, the fact that she had fallen ill in these circumstances, was sufficient evidence of her moral character*" (p. 61). When the idea is reconceptualized with an appropriate moral justification, it no longer imposes such a terrifying presence upon conscious processes. Consequently, the development of the emotion is no longer inhibited by repression.

The transformation of the structure of the I or the ego that accompanies acceptance of responsibility for one's drives implies a shift from unconscious guilt to conscious guilt. Unconscious guilt is an intentionality disrupting or problematic presence imposed upon the I whereas conscious guilt is a fully developed emotion that helps to construct goal-directed action. The ideal-I is an emotional component of ego functioning. Jonas (1966) says that animate life continually transcends itself with respect to two "horizons": "internally that of time as the next impending phase of its own being toward which it moves" and "externally that of space, as the locus of the co-present 'other' on which it depends for this very continuation" (p. 100). The two basic modes of

transcendence are emotional-intent and perception. "Life by its nature faces forward and outward at once" (p. 100). Explaining the same idea further, Lear (1990) says,

> For an I to emerge, the I must be able to distinguish fantasy from reality. This requires not only that the I differentiate itself from the world in which it lives [spatial horizon]; the I must also differentiate itself from what it would be [temporal horizon]. . . . What it is for an I to come into existence is to be split from its own sense of what it might be. The sense of distance, of falling short of what I might be, is thus not an accident: it lies at the heart of the I's existence. (p. 167)

The ideal-I is the goal-directed and mature emotional component of the I. Every intellectual state has its own corresponding emotional state. The I understood as an executive center exhibits two fundamental cognitive components: first, the capacity to form, activate, and execute action plans according to executive intent and perceptual information and, second, to transform a corresponding, continuously flowing quantity of energy into an ecologically structured *orientation* toward what one might become. The I transcends the spatial horizon, whereas the ideal-I transcends the temporal horizon. Emotion thus functions as a kind of regulative ideal for action. While perception is concerned with a current state of affairs, desire emphasizes what may be produced through action, of what does not presently exist as desired but may be brought about through action. The number of intermediate steps over which any purpose or goal can extend itself "is a measure of the stage of emotional development" (Jonas, 1966, p. 101). Emotional maturity is manifested in the coherence of long- and short-term structures of action patterns.

Now Benjamin (1988) in effect extends Lear's discussion of the individuation process into the domain of interpersonal relations. Here is where we shall be able to further clarify the distinction between archaic forms of identification and forms of identification that make development possible. Benjamin's discussion will also distinguish archaic forms of autonomy and sociability from individuated forms of autonomy and sociability and thereby nearly complete this study's reconceptualization of

the individual. Afterwards comes Lear's discussion of the constancy of human values. Lear's account of value complements Gibson's account of affordances. Last is a brief description of character education.

Traditionally, social theorists, including Freud, have argued that domination or repressive control of our primitive impulses is essential for establishing and preserving civilization and peaceful social relations. Hence, civilization demands that some of our better and more creative instincts must be abolished. Without coercive control, people would lawlessly proceed according to base, self-serving impulses. A general state of chaos or war of all against all would result. Power and authority are assumed to be negative or prohibitive but never empowering to anyone but the group. According to Benjamin (1988), a fundamental source of trouble is the universal desire for recognition by others of individuals' own agency and value. Others tell us in their words and behavior whether we are good or bad, strong or weak, smart or stupid, and attractive or ugly. One's sense of self-esteem is thus confirmed or denied by others. Since such recognition is not always given freely, rivalrous struggles among persons and groups are commonplace. The critical balance within individuals between aggressive self-assertion and recognition of others must therefore be externally imposed by the group upon the individual and by more powerful groups upon other less powerful groups. Moral law and social order are thus functions of oppressive power. Benjamin (1988) says:

> In truth, Freud's understanding of authority is more complex than this choice suggests. He does take into account what we may call the culture's "erotic" means of binding individuals in spite of their resistance. Obedience to the laws of civilization is first inspired, not by fear or prudence, but by love, love for those early powerful figures who demand obedience. Obedience, of course, does not exorcise aggression; it merely directs it against the self, infusing the voice of conscience with the hostility that cannot be aimed at the "unattackable authority." Freud has thus given us a basis for seeing domination as a problem not so much of human nature as of human relationships--the interaction between psyche and social life. It is a

> problem that must be defined not simply in terms of aggression and civilized constraints, but as an extension of the bonds of love. (p. 5)

Early social bonds function as prototypes for all later interpersonal relations.

According to Benjamin (1988) the recognition of others is important because it simultaneously confirms our own sense of agency or power and sense of satisfaction with ourselves and a corresponding sense of well-being and self-worth. Interpersonal security is therefore basic for one's own sense of autonomy and individual satisfaction. Benjamin distinguishes two kinds of recognition: one way and mutual. In one-way recognition there is a kind of dichotomy between two persons, one who recognizes and the other who confers recognition. Either one is the active locus of agency and volition who is recognized as an autonomous subjectivity or else one is the passive locus of unquestioning sociability, an object of control who recognizes but is not recognized. One is either an autonomous subject of attention or a sociable object of attention.

Mutual recognition is two way. Two or more autonomous agents recognize one another. Each person recognizes another as an autonomous subjectivity and concurrently is recognized by another as an autonomous subjectivity. Sociability is conceived as an interpersonal ability from which autonomy emerges. Individuals are both autonomous and sociable. Mutual recognition is the basis of intersubjectivity. According to Benjamin (1988) intersubjectivity is transformed into its one-way, more primitive alternative when there is"a breakdown of the necessary tension between self-assertion and mutual recognition that allows self and other to meet as sovereign equals" (p. 12).

Benjamin (1988) argues that the concept of recognition covers a fairly wide range of interpersonal interactions, perhaps more than we might initially suspect.

> Recognition is so central to human existence as to often escape notice; or rather, it appears to us in so many guises that it is seldom grasped as one overarching concept. There are any number of near-synonyms for it: to recognize is to affirm, validate, acknowledge, know, accept, understand, empathize, take in, tolerate, appreciate, see, identify with, find familiar, . . . love. (p. 16)

Explaining further, Benjamin says that "*mutual recognition* includes a number of experiences commonly described in the research on mother-infant interaction: emotional *attunement*, mutual influence, affective mutuality, sharing states of mind" (p. 16, italics added). Mutual recognition means that two independent or autonomous subjects experience the presence of one another's subjectivity. The "issue is not how we become free of the other, but how we actively engage and make ourselves known in relationship to the other" (p. 18). The problem is in the

> twisting of the bonds of love. Domination does not repress the desire for recognition; rather it enlists and transforms it. Beginning in the breakdown of the tension between self and other, domination proceeds through the alternate paths of identifying with or submitting to powerful others who personify the fantasy of omnipotence. For the person who takes this route to establishing his own power, there is an *absence* where the other should be. (p. 219, italics added)

Insofar as one person controls the actions of the other and the other conforms to that control, omnipotent thinking and alienation regulate the interpersonal situation. For Benjamin, problematic interpersonal relations are those which "omnipotence" is "projected upon the other or assumed by the self" (p. 36). The prototypical examples are based on mother-infant relationships. Problems become evident when a parent or caregiver immediately responds to the tyrannical demands of the infant with either capitulation or retaliation. The problematic response falls to either the pole of complete control or to the opposite pole of powerlessness.

Benjamin (1988) explains the individuation process in terms of "destruction" and "survival" of the object (p. 68). "Destruction . . . is a way of differentiating the self--the attempt to place the other outside one's fantasy and experience him as an external reality" (p. 68). Another mind or locus of desire and control is thereby disclosed. The fantasy representation is what is destroyed while the genuinely other person is who survives. Perception displaces representation. Benjamin explains further:

> When the child experiences the parent as caving in, he continues to attack, in fantasy or reality, seeking a boundary for his reactive rage. The child who has been indulged, allowed to abuse his mother (or both parents), and given no limits to his fantasy of omnipotence, is the typical "sadistic" child. ("I can't control him," says the parent, and then repeats for the fifth time, "Michael, if you don't behave, you'll have to leave the table and go to your room.") For him, the real object, the one who cannot be destroyed, never comes into view. For him, agency and assertion are not integrated in the context of mutuality and respect for the other but in the context of control and retaliation. The sadist-child is *cognitively* aware of the difference between self and other, but *emotionally* this awareness is hollow and does not counteract the desire to control the other. (p. 70)

A child who is cognitively individuated is not necessarily emotionally and motivationally individuated. Recall that individuation is a developmental process and an achievement. Rycroft (1972) explains that "individuation" is the "process of becoming an individual, or becoming aware that one is one" and the term includes "not only the idea of becoming aware that one is separate and different from others, but also the idea that one is oneself a whole, indivisible person" (p. 80). The parent or caregiver who is *immediately* responsive to a child's every wish facilitates, for the child, the illusion of mental control of the interpersonal world. For the child, the actions of the caregiver *appear* as an extension of his own wishes. That is to say, another person is not distinguished from an internal, archaic representation or projection. A distinct locus of control and desire is *absent* from the cognitive field. Another separate person is therefore not revealed or disclosed. In the above passage the parent does not identify herself as a separate or independent subject of desire and control. Benjamin (1988) says that "when things are not resolved 'outside' between self and other, the interaction is transformed into the world of fantasy" (p. 71). Insofar as a caregiver is immediately responsive, the child's mental representation is not subjected to reality testing and primary process activity can regulate the interpersonal situation. When there is no meeting of separate or independent minds, the child acquires a sense of alienated or isolated autonomous control and the mother an alienated sense of imposed or coerced sociability.

Benjamin (1988) argues that when self-effacing or extremely permissive caregivers or parents worry that their child will not emotionally survive the disillusionment process of reality principle acquisition, they may compensate by creating a perfect world in which the child "can get everything he wants" (p. 35). A calm and happy child reflects well upon a parent's sense of self-esteem, whereas an angry, upset, or frustrated and retaliating child can be a blow to a parent's own narcissism. The problem is that the perfect world is not good enough for individuation.

> The self-obliteration of the permissive parent who cannot face this blow does not bring happiness to the child who gets everything he demands. The parent ceases to function as an other who sets a boundary to the child's will, and the child experiences it as abandonment; the parent co-opts the child's intentions by agreement, pushing him back into illusory oneness where he has no agency of his own. . . . The child who feels that others are extensions of himself must constantly fear the emptiness and loss of connection that result from his fearful power. (p. 35)

Omnipotence or illusory mental control must be distinguished from real control or agency in a world that resists and frustrates but also responds to one's efforts. Control is omnipotent insofar as the world immediately conforms to one's wishes, whereas the exercise of independent or separate agency or control emerges from the world of independent causal relations and separate or autonomous other persons. A sense of agency emerges from the structure of one's own coordinated performance and the culturally organized recognition of other persons. Recognition requires a "viable other" (p. 39). Benjamin explains that "if the mother sets no limits for the child, if she obliterates herself and her own interests and allows herself to be completely controlled, then she ceases to be a viable other form him" (p. 39). Recognition is neither significant, empowering, nor informative unless it proceeds from an independent subject of desire and control. The positive and negative recognition of others is the cultural equivalent to the physical forces that both impede and make possible and tune our own performances. Without the disclosure of other minds we can easily become vulnerable to the activity of

our own imagination or primary process activity. A parent or other who withdraws from or submissively conforms to one's every demand is emotionally absent and cannot afford responsive social interaction. We might therefore incorrectly and impulsively imagine that we are always right or always wrong about something. Attunement with another mind can serve to destroy such a problematic illusion of cognitive certainty. Explaining further, Winnicott says that

> if a baby cries in a state of rage and feels as if he has destroyed everyone and everything, and yet the people around him remain calm and unhurt, this experience greatly strengthens his ability to see that what he feels to be true is not necessarily real. (Benjamin, 1988, p. 40)

But an overresponsive and oversensitive (sociable) or an underresponsive and insensitive (autonomous) interpersonal world tends to form and confirm poor habits of independent action and emotional regulation. One must develop and form habits of acting and being affected both according to the demands of one's own unique temperament or drive activity and to the demands of cultural, moral, and natural or physical law. This requires the caring attention of intelligent parents and teachers.

Lying at or near the opposite pole of emotional life (and perhaps philosophical prejudice), a child may project omnipotence on a self-asserting, controlling parent and a corresponding sense of complete powerlessness upon the self. The child assumes the role of self-effacing sociability and projects upon the parent that of self-asserting, autonomous power. Here we have an inversion or reversal of polarized roles. Elaborating further, Benjamin (1988) says,

> Alternatively, the parent who cannot tolerate the child's attempt to do things will make the child feel that the price of freedom is aloneness, or even, that freedom is not possible. Thus if the child does not want to do without approval she must give up her will. This usually results in the "choice" to stay home and remain compliant. Not only is she in constant need of the parents' protection and confirmation in lieu of her own agency, but the parent remains omnipotent in her mind. (p. 36)

Again, recognition of another and self-assertion are one way. There is no mutuality here. This is an archaic form of identification in which authority is the exclusive function of one person and obedience the exclusive function of another. Polarized interpersonal patterns of relating may be repeated unconsciously and chronically. Benjamin says that

> like the sadist's aggression, the masochist's submission is ambiguous, conflating repetition of an old frustration with the wish for something new. Ghent suggests that it is a wish to break out of what Winnicott called the "false self." The false self is the compliant, adaptive self that has staved off chaos by accepting the other's direction and control, that has maintained connection to the object by renouncing exploration, aggression, separateness. (p. 72)

The "false self" therefore creates the illusion that character functioning is reducible to environmental causes or influences. That is to say, behavior appears to be regulated extra systematically. The structure of the wholly other directed, false self is analogous to that of the unthinking motor system of Chapter 4. Associationism, again, seems more closely related to pathological episodes or breakdowns than to normal, healthy functioning. Explaining the false self further, Benjamin says,

> This compliance is associated with another kind of failed childhood destruction, one in which the self has not survived. The "masochistic" child has not endured caving but retaliation, in the form of either punishment or withdrawal. He destroys the other only in fantasy; he will never take a full swing at the parent to test if she will survive. His rage is turned inward and apparently spares the other, yet the loss of a viable other overshadows the struggle to differentiate. (p. 72)

The fear of the loss of interpersonal security is a powerful source of motivation for the compliant character. While the compliant character fails to assert his own identity, the controlling character indulges in self-assertion. "In both cases," however, "the sense of omnipotence survives, projected onto the other or assumed in the self; in neither case can we say that the other is recognized, or, more modestly (given the child's age), the process of recognition has begun" (p. 36).

In the case of domination, a balance or tension between recognition of others and self-assertion that exists *within souls* that operate at a well-developed level of psychic organization is transferred to the domain of *interpsychic* or that operate at lower levels of intrapsychic organization or unity. Two archaically organized souls form the same kind of complementary, dual-unity that is found in the structure of a *single* well-organized individual. That is to say, the motivational states of two persons who are functioning at an archaic level reproduce the same kind of structure that operates in one well-organized individual. In domination and control between two persons, each person functions roughly as a half of an individuated person. Neither person is a fully functional individual. Benjamin explains that while a controlling character emphasizes active, exploratory, self-asserting, and autonomous behavior, the submissive character emphasizes passive, passively receptive, self-effacing, and sociable behavior. One is an inverted mirror image of the other. Whereas the autonomous person wishes to reach, find, discover, penetrate, or release the sociable other, the sociable character wishes to be reached, found, discovered, penetrated, or released. According to Benjamin's account, an individuated character is a well-integrated and reliable balance of *both* active and passive qualities. Frustration is likely when the passive character wishes for recognition while refusing to identify him or herself. Within the dual-unity of complementary pairs, the active other is for the passive self an idealized projection or representation. Lear (1990) says that "this externalization of one's ideal-I is the essence of deindividuation. The person has abdicated his conscience to the external world and, in the process, ceased to be a fully fledged person" (p. 198). The boundaries between individual psychic functioning become "blurred" (p. 197).

The key to intersubjectivity, in contrast to interpersonal relations governed by archaic submission and control, is the object's destruction and survival. Benjamin (1988) says that "if he does not survive, he is not there to recognize me" (p. 38). The mental representation of the other must be destroyed and replaced by perception not subject to

mental control. Control of social action or interpersonal relations is consequently returned to perception and perceptual information. Function is simultaneously restored. For Benjamin, while "*intersubjectivity*" has been defined as "the moment at which we know that others exist who feel and think as we do," this "moment marks a decisive point along" a spectrum of intersubjective development "at which the infant more consciously recognizes the other as *like and different*" (p. 30). Interpersonal attunement and recognition is possible only when independent sources of desire and control *simultaneously* identify themselves and recognize one another. Interpersonal representation must be displaced by interpersonal attunement. Benjamin says that "the decisive problem remains *recognizing the other*. . . . Establishing *myself* means winning the recognition of the other, and this, in turn, means that I must finally acknowledge the other as existing for *himself* and not just for me" (p. 36). In other words, valid recognition can be obtained only from an independent individual who pursues his or her own unique interests, someone who is both a subject and object of attention. My acknowledgment of the other as a unique and separate locus of power and desire implies that the other's recognition of myself is not coerced but genuine. Balanced self-assertion does not lead to domination. Winnicott, Benjamin says, "concluded that one of the most important elements in feeling authentic was the recognition of an outside reality that is not one's own projection, the experience of contacting other minds" (p. 37). In ecological terms the self is specified and therefore known by means of what there is to be perceived and acted upon. To perceive the interpersonal world is to coperceive oneself. An authentic self is not knowable otherwise. Because only a viable other specifies *my*self and thereby makes the cultural and moral shaping and organization of *my*self possible, a viable other is an interpersonal affordance. Gibson (1979) says,

> An affordance . . . points two ways, to the environment and to the observer. So does the information to specify an affordance. But this does not in the least imply separate realms of consciousness and matter, a psychophysical dualism. It says only that the information to specify the utilities of the

> environment is accompanied by information to specify the observer himself. (p. 141)

Separate realms of consciousness and matter are the illusory implications of the structure of interpersonal representing and omnipotent thinking.

Dualism may be mistakenly inferred from interpersonal relations that are regulated by polarized, archaic processes. Individuation implies, for Winnicott, a transition from object "relating" to object "using" (Benjamin, 1988, p.37). In the terms used by Leder (1990), the shift is from the immanence of bodily dys-appearance to the transcendence of bodily disappearance or from the disclosure of world-concealing psychological and physiological states to the disclosure of the states of the world that lie beyond the self. Benjamin (1988) explains: "'Relating' refers to the experience of 'the subject as isolate,' in which the object is merely a 'phenomenon of the subject'" (p. 37). In contrast, "'using' does not mean instrumentalizing or demeaning, but being able to creatively benefit from another person; it refers to the experience of 'shared reality' in which 'the object's independent existence' is vital" (p. 37). The other or object understood as an interpersonal affordance implies a secure means-end continuity and intersubjectivity. Individuals simultaneously recognize one another as both subjects and objects of value or moral worth. An autonomous other is *both* an end in him or herself *and* a means toward my own subjectivity (but *never* a means alone, regardless of the end). Benjamin elaborates upon the essential transition from the isolated self to disclosure of self and other:

> When the subject fails to make the transition from "relating" to "using," it means that he has not been able to place the object outside himself, to distinguish it from his mental experience of omnipotent control. He can only "use" the object when he perceives it "as an external phenomenon, not as a projective entity," when he recognizes it *as an entity in its own right*." (p. 37)

A shared reality and shared emotional states are not possible without two independent sources of desire and control. The archaic merger or archaic identification of two

characters implies that the same or similar psychological states cannot be shared since each member of a complementary pair experiences either the active or passive components of a single, fully formed psychological state. Because neither character expresses a fully formed emotion but undergoes or suffers either its active or passive part, each character is *confined to* his or her own incompletely formed and other concealing psychological and physiological states. The traditional philosophical problem of knowing other minds is personified in the pathology of isolated, autonomous control and submissive sociability. Sharing psychological states requires two or more individuals who each possess the same or similar kind of fully formed psychological state. Knowing another mind requires sameness and difference. Only functionally separate minds can know one another. Only when minds are functionally separate can one internalize and identify with the psychic organization of the other. Because individuation is produced by a series of identifications and subsequent separations and losses, sociable and autonomous complementary pairs impede or paralyze the individuation process. Such relationships personify love's regressive tendencies, and complementary pairs may resist separation because there is no internalization and therefore no compensation in growing psychic structure. Lear (1990) says,

> This entire dialectic of development is fueled by love and loss. I become an I in response to the fact that there is a separate world that is not identical with me. I identify with the world because I am not identical with it. I take in the world, and thus constitute myself as compensation. (p. 163)

The "outcome of my love affair with the world is a development in psychic structure" (p. 165). Love is therefore not an exclusively regressive disposition. "Love . . . also pulls in the opposite direction. It fuels human development and pulls us toward higher, more differentiated unities" (p. 150).

Autonomy emerges from sociability insofar as interpersonal relations operate according to the principles of individuated character functioning. That is to say, individuated autonomy emerges from intersubjective interpersonal relations, while

individuated autonomy makes intersubjective interpersonal relations possible. Autonomy thus reconceptualized presupposes a differentiated-unity or continuity between the individuated self and others and between the mind and nature. Influence is mutual or two way. Only to the extent that an interpersonal world is peopled by psychologically or emotionally individuated individuals or persons can it afford identity formation processes and mutual recognition. The I emerges from the not-yet-I and the not-yet-you, a largely undifferentiated or unstructured proto idealistic state, by means of taking in and owning the qualities of the world. Lear (1990) explains,

> It is from these identifications that I begin to form and, as the other part of the process, a world of distinct objects comes to be for the emerging I. As psychic structure begins to form, the level and type of organization of which I am capable correspondingly develops. For as there comes to be a world of objects for me, what I can identify with increases in complexity and structure. . . . As I develop in complexity, I am increasingly able to appreciate and identify with every more complex love objects. (p. 162)

The development of psychic structure can continue as long as the world outstrips my power to appreciate it. As my psychic structure becomes more qualified and my capacity for mutual recognition grows, what the world affords myself grows proportionally. There is a growing capacity for detecting and producing ever higher order invariant meaning-structures or affordances. "As I develop in complexity, so does the world as it exists for me" (p. 177). According to Lear it is a fundamental mistake to suppose that such capacities produce the structures of the interpersonal world. Although an invariant-structure is a meaning structure only when there is someone who perceives and acts upon it, the invariant structure is there whether it is or is not an object of cognition. The fundamental mistake is to suppose that psychological construction processes project or impose values upon a value neutral world.

According to Lear, the structure of the world is what makes the structure of the individual mind possible. Put differently, the actions of the world are what affords or makes possible my actions. Lear rejects the dichotomy between a value rich mind and

value neutral world and the nihilistic implications. Lear (1990) says that "nihilism is the view that things have value solely in virtue of being valued by humans" (p. 184). The implication is that meaning structures derive their invariance and significance from the mind alone. This is a largely or entirely introspective orientation in which only the value rich person or subjective perspective is experienced and the external, objective perspective is merely inferred. Other minds are supposedly known only through inferences. But as Benjamin (1988) shows, otherness is disclosed by setting limits to our "mental feats" (p. 71). Otherwise emotions have no intentional object. One is alone. The nihilistic view implies that there are no intentional objects except in theory. Lear (1990) proposes that the apparently unlimited variability or inconstancy in an individual's choices of love-objects does not prove that values are purely subjective determinations without objective constraints. The inconstancy of the succession appears only at the level of qualities viewed in isolation from functional unity. "At the deeper level of psychic significance, it would seem that the bonds between sexual drive and its objects are all but impossible to undo" (p. 184). According to Freud, the child or infant at the mother's breast is a prototype for every love relation throughout the life of an individual. Lear explains that the "finding of an object is in fact a refinding of it" (p. 129). Explaining further, Lear says,

> This refinding is not a purely physiological process, as when the leaves of a plan "refind" the sun. Freud's point is that no matter how distinctive a later love relation may appear, for the person involved there will be psychic resonances with the earliest, most primitive emotional-sexual bond. (p. 130)

Another person who can produce the same emotional experience can be detected in spite of unlimited variability in appearances. That is to say, the action and perception system is permanently *attuned* to others who can reproduce the same interpersonal and self orientation. Even though the object or idea may seem altogether different from the exclusively secondary process perspective, it is permanently connected through a network of resembling ideas or associations to an appropriate emotion. "Repression, it

seems, can never truly sunder an emotion from its idea" (p. 92). At some level, an early emotional experience is relived in its original qualitative and quantitative characteristics whether one is or is not consciously aware of its significance. The same emotional experience is repeated throughout one's life only because we are able to detect the interpersonal situations that produce the same response and orientation. Each new instance is a variation of the same early theme. Individuals therefore exhibit a high level of constancy with respect to values. The first-person or internal or subjective perspective and the third-person or external or objective perspective are ontologically continuous, even if functional continuity is not obvious. "By ignoring the sexual object's psychological significance, one cuts the drive loose from the mooring that gives it meaning. And by taking the observational stance, one ironically deprives the external world of its significance" (p. 132). The observational stance or the exclusively external, value neutral perspective simply excludes symbolic meanings and the first-person orientation. Without the psychological perspective there is nothing to organize qualities into significant or functional combinations or groupings. Individuals are reduced to part-objects or timeless subpersonal entities and the objective world to isolated physical qualities or properties. By conceptually isolating the mind from the wider cultural, physical, and organic systems that affords its functioning, researchers lose the very subject matter they intend to study.

Lear argues that a human mind does not create its own loving world but emerges from a loving world and uniquely recreates that world in its own psychic structure. Lear (1990) insists that "it is not that humans make the world loveable by investing it with their love; it is because the world *is* loveable that humans can develop into creatures capable of loving it" (p. 184). The capacity for responsiveness, like recognition, is there or exists whether I am or am not there to perceive and respond to it. If it is purely my own creation, then it is not genuine loving responsiveness. An independent locus of control and desire is essential. "Since the form of the world informs the human mind,

there are constraints on what form the world can have if there is to be a human mind. . . . [O]therwise there could be no human values" (p. 185). The two forms of organization are complementary; a human mind is a unique system that is functionally coherent to the extent that it is cognitively connected to the wider cultural, organic, and physical systems that produce, shape, and direct its life. Basically, Lear's argument is that if the world were not loving and loveable, then we would not be either. But we are, so the world must be, too. Consequently,

> if the mind is formed, as psychoanalysis teaches, by taking in the qualities of the world and reestablishing them as intrapsychic structure, there ought to be constraints on how the world can be such that the internalization of that results in a human mind. (p. 185)

The world specifically affords a human mind, while such a mind specifies its world.

> In the most general case . . . a person is erotically bound to the world. That is a condition of there being a world for him: that is, it is a condition of his sanity. But if our tie to the world is genuinely erotic, we can no longer conceive of the world as a mere receiver or inhibitor of our discharges. Love is not just a feeling or a discharge of energy, but an emotional orientation to the world. (p. 153)

Neither the world nor living bodies are machines. The body is not an externally regulated and unthinking motor system. An individual is an emotionally oriented action and perception system.

In review and summary let us examine the general argument of this chapter. This should disclose the logic of the whole chapter. Emotional and motivational states simultaneously operate or are disposed to operate within an individual person at different levels of psychic organization or development. Uncontrolled behavior arises to the extent that distinct levels of psychic organization are simultaneously operating but are not functionally integrated. Unacceptable and involuntary impulses are determined by lower levels of psychic organization or development. Acceptable impulses or desires that cohere with the mind's overall conscious organization of belief and desire operate at a higher level of psychic organization. Different levels of intrapsychic unity or complexity

result in distinct forms of character functioning or behavior and interpersonal relations while implying specific concepts of cognition, autonomy, and sociability. Solely from the perspective of lower levels of intrapsychic organization, it appears that autonomy and sociability cannot be coherently integrated within a single individual. Corresponding interpersonal situations imply incoherent concepts of cognition, autonomy, and sociability. Coherence, however, is implied by higher levels of intrapsychic unity. From the perspective of higher levels of intrapsychic or developmental unity, autonomy and sociability can be coherently integrated within a single individual. Although higher levels of unity considered alone suggest that the traditional dichotomy between autonomy and sociability is strictly a pseudo-problem generated by confused and groundless theory, the holistic, developmental perspective (which considers a broad range of developmental levels) implies that this dichotomy is an illusion grounded in the structure of impulsive behavior (which operates at lower levels of psychic development or unity). In assuming that such a dichotomy is universal, one presupposes that individuals are reducible to what this chapter conceives of as a lower level or state of psychic development. The dynamic characteristics of cognition are largely ignored or excluded while psychic structure is conceived as a static or timeless entity.

Bennett's (1999) popular teacher education text implies that teachers categorize students according to autonomy and sociability. She does not acknowledge the possibility that such categories *could* encourage teachers to engage in primitive or archaic forms of identification. In order to use the right method of instruction, Bennett proposes that students should be sorted out according to cognitive and emotional styles. For instance, insofar as individuals are "intrinsically motivated" and "unresponsive to social reinforcement," they are not "extrinsically motivated" and "responsive to social reinforcement" (p. 182). Here we have a sliding scale of motivation that is reducible to a dichotomy of opposed inner and outer causal powers or agencies whereby one regulates action more than the other. Bennett's autonomous or "intrinsically motivated" and

socially unresponsive student greatly resembles Benjamin's aggressively self-assertive character who demands the recognition of others while refusing it to others. The problem is that Bennett's categories fail to acknowledge and can function to impede or arrest the individuation process. A teacher could unwittingly collaborate in an archaic identification process by conforming to the demands of controlling or sadistic characters. Such conformity or archaic identification could actually teach controlling characters to be more "unresponsive to social reinforcement," "insensitive to others," and to be satisfied with "poorly developed social skills" (p. 182). Basically, the school tends to become a place for students to practice what they already know instead of a place for learning and character development or individuation. Also, insofar as the classroom or interpersonal situation is regulated by archaic identification processes, teachers cannot identify themselves as independent or separate sources of desire and control. Without such differentiation students cannot internalize and incorporate the morally significant behavior of the teacher. In other words, the student cannot learn by examples set by the teacher.

The same kind of problem is implied, or at least suggested, by Bennett's (1999) more sociable character or learner who is "highly sensitive and attuned to" the "social environment" and exhibits "highly social skills" (p. 182). The above problem is simply inverted or reversed. Bennett probably does not know what Benjamin, Gibson, or Turvey mean by attunement. Bennett's categories reduce students to part-objects or subindividual capacities whereby they are either wholly active or wholly passive. The field-independent learner is an autonomous or self-assertive character who is disposed to favor "independent study" (p. 182) and the "discovery approach" to learning (p. 185), whereas the field dependent learner is a sociable or self-effacing character who favors the socially oriented, "spectator approach" to learning (p. 182). Bennett's dichotomy between the self-assertive exploratory character and the passively receptive observer is a close match for Benjamin's sadistic character who searches for the other and masochistic character

who wishes to be found. But for Benjamin these polarized categories signify neither permanent and fully developed states of character nor principles that should permanently regulate the learning situation. Instead, they suggest the emergence of a growing individual. Benjamin (1988) says that the "masochist's wish to experience his authentic, inner reality in the company of an other parallels the sadist's wish to get outside the self into a shared reality" (p. 71). Such characters are wishing for someone who sets limits to their mental control or archaic activity and pass the reality test that only an individuated person or teacher can pass. Elaborating further, Benjamin says:

> These dynamics, then, are not merely the stuff of domination; they are also what make mutuality possible. They allow us to maintain connection so that we are not shut off from the world in a monadic capsule of mind. Mental omnipotence signifies the absence of this connection, a breakdown of differentiation in which the self is assimilated to other and other is assimilated to self. (p. 73)

Assimilation or archaic identification thereby displaces intersubjectivity or "exchange with the outside" (p. 73). Intersubjectivity or interpersonal attunement is what Bennett's categories cannot comprehend; instead, they unwittingly encourage the teacher either to rigidly control or to be completely controlled by students. They fail the reality test. Benjamin explains that the "reality principle" is a "positive source of pleasure, the pleasure of connecting with the outside, and not just a brake on narcissism and aggression" (p. 41).

Benjamin (1988) conceptualizes teaching in terms of Winnicott's description of the "holding environment" (p. 120). The maternal holding environment is a prototype for later intersubjective interpersonal relationships. Although later relationships function at a higher level of interpsychic and intrapsychic complexity, the common recurring pattern is that of mutuality and a balance of structure and freedom, of closeness and distance, and of unity and separation. "The good teacher is one who provides you with structure *and* allows you freedom to immerse yourself in your own imagination, to explore, even make

mistakes, until you can finally express your own vision" (p. 120). When you do get things right, the teacher recognizes that it is right and right for you. There is an intelligently directed balance of creativity and discovery. The child or student can pursue goals with limited independence or separation from the teacher or caregiver. A "transitional space" is essential for the holding environment (p. 126). The transitional space allows for the creative interplay between creative imagining and cognition of reality. There is a balance between illusion and disillusionment that is adapted to the infant's, the child's, or the student's capacity for emotional regulation and independent action.

In a good enough world or learning environment the shift from fantasy to reality does not come as a rude or abrupt shock. Also, for Winnicott, a finely tuned use of illusory or archaic identification is healthy and never completely given up and therefore always remains a good pedagogical instrument. The holding environment facilitates a felicitous shift from the "here" of archaic imagination to the world that is "there" to be perceived. Benjamin (1988) says that a

> transitional space . . . permits the important experience of being and playing alone in the unobtrusive but reassuring presence of the other. In the relaxation of this space it is possible to know one's impulses (drives) as coming from within, to know them as one's own desire. (p. 127)

The child is not coerced to find him- or herself "vicariously in the other" (p. 121). There should be an intelligently directed balance between freedom and structure as well as closeness and distance.

> Winnicott often quoted a line of poetry from Tagore to express the quality of the holding environment and the child's transitional area: "On the seashore of endless worlds children play." The image suggests a place that forms a boundary and yet opens up to unbounded possibility; it evokes a particular kind of holding, a feeling of safety without confinement. . . . [I]n the face-to-face interaction of mother and infant, the early representation of self and other evolves in part through distance and closeness, a shifting of spatial boundaries between two bodies. When this play is successful, it is as if both partners are following the same score. The "dance" becomes the mediating element between the two subjects, the movement in the space between them. (p. 127)

The search for recognition can be a mutually coordinated "dance" or antagonistic power struggle. An infant should thus have some freedom to engage or disengage the attention of the mother or caregiver according to its own capacities for emotional regulation and independent action. By analogy, the learning situation for a more mature child should provide balance of independent exploration and intelligent guidance. Character education practices are implied by the "holding environment" concept. Perhaps, field-independent learners should be encouraged to work with others, while field-dependent learners should be encouraged to pursue independent study. Self-assertive characters should be encouraged to listen more to others while self-effacing characters might try being more self-assertive. Exploratory types might try observing a little more whereas passive spectators might explore a little more. The main thing is that such categories must be given a reality test because their very use may produce the mere illusion of their truthful character. Abilities that are never used cannot be developed. Character education and the success of the individuation process require some experimenting.

CHAPTER 6
IMPLICATIONS FOR EDUCATION AND LEARNING

A key purpose of this study has been to sort out various conceptions of cognition, emotion, perception, and action as well as those of autonomy and sociability in order to connect theoretical meanings of these ideas to their respective levels of psychic development and modes of embodied experience. Different modes of experience and levels of developmental unity accompany diverse orientations that in combination imply different, specific theoretical conceptualizations. The traditional tendency to conceptualize psychological and physiological states independent of states of the world and goal-directed action and perception entails a suspension of the natural attitude or common sense orientation to the world. Consequential concepts of mind or the individual are consistent with the dys-appearing modes of embodiment that accompany psychically or physically uncoordinated performances. Well-being is seen as a state of mind that makes the quality of one's being-in-the-world of nominal significance. Such an orientation to oneself and the world can be maladaptive when it becomes an end in itself. We end up with theoretical confusion and psychological theories that are not obviously false but are confined to descriptions of *narrowly* conceived mental processes or pathological episodes.

Rather than treat mind as an other-worldly abstraction, a non-dualist, ecologized theory of embodied mind equates mindfulness with the coordination of self and world. As this chapter will reveal, the ecological implications for education are at variance with practices and ways of thinking about teaching and learning that are derived from reductive, non-ecological approaches. Traditional approaches to instruction tend to isolate particular fields of study from their use value. That is to say, students frequently

do not have any immediate or concrete sense of what their present subject of study currently means for themselves. Insofar as they work exclusively for grades or other future rewards, the subject tends to become a mere means to ends beyond itself. Thinking thereby tends to become disconnected from purpose or function. As this study argues, function or purpose empowers autonomous and flexible intelligence. The traditional means-end discontinuity tends to harden and disempower intelligence. The problem for traditional learning theories is to get students to learn without being interested in what they are being taught, that is, without natural motivation. The ecological approach implies that we do not need such a sophisticated bag of psychological tricks if learning is holistically restored to the world of ordinary or qualitative experience. The personal aims of the student should be integrated with the aims of education.

Traditional learning theories are generally based on either empiricist or rationalist assumptions. Recall that while both approaches presuppose the principles of associationism, the empiricist argues that the formation of experience-based associations determines intellectual activity or processes, while the rationalist argues that intellectual activity or processes govern the formation of associations and the structure of experience. Although the theoretical difference is that of a top-down, hierarchical structure and a bottom-up hierarchical structure, the association-forming sensory-system or executive center resides in the top of both. Both approaches imply that psychological form determines cognitive functioning. Hence, the two approaches have common implications and problems. Even so, the dichotomy implied by traditional alternative concepts of the solitary, detached, and immobile spectator or cognizer has generated a long history of debate about whether learning is based on experience or native intellectual capacities.

The ecological and traditional approaches imply distinct aims for education and the development of the individual. According to the ecological approach, learning is both a means to an end and an end in itself, whereas traditional approaches imply that learning is a means to a separate or discontinuous end. Ecologically oriented learning is always

connected to an individually interesting purpose. Because functionally oriented learning can be flexibly and deftly transferred to new and different situations, the ecological approach implies that education facilitates the individuation process and the autonomous capacity for continuing growth or self-development. The reductive perspective of traditional approaches foster habits of dependency. The ecological approach implies or, at least strongly suggests, that, as Dewey (1916) says, "The aim of education is to enable individuals to continue their education--or that the object and reward of learning is continued capacity for growth" (p. 100). A complementary implication of individuated functioning is that one can autonomously learn from experience or life itself. Based on past learning, one achieves a significant ability to teach oneself. An ecological orientation implies the required kind of learning. To the extent that traditional theories influence education practices they impede such development. Let us explore the implications of each approach.

Traditional approaches, in principle, reduce the student to abstract and timeless categories of cognitive and character functioning. To the extent that such categories are put into practice, the aim of education is to develop capacities and character traits in conformity with some predetermined view of individuals and the world. Recall that the hierarchical form of organization assumed by this perspective was seriously undermined by Turvey (1977, 1990) in Chapter 4. An unexamined and fundamental implication is that the future states of the world must be encoded or specified in the present states of the mind. The coordinated execution of a complete cycle of locomotion requires that the mind or executive center anticipate and unequivocally specify every possible state of the world and every corresponding alternative movement pattern. Turvey shows that such comprehensive specification is both impossible and unnecessary. First, insoluble paradoxes aside, the required representation system would be infinitely complex. Second, because action structures are tuned according to perceptual information that is not unequivocally specified in an executive action plan, the action plan does not need to

represent or anticipate every possible state of the world and corresponding movement pattern. The a priori knowledge of an executive action plan is highly ambiguous. But the unpredictabilities or ambiguities of the world of qualitative experience are reliably handled by the coordination of executive intent and perceptual control of action. We should therefore question the assumption that fixed and timeless categories unequivocally specify antecedently existing traits of autonomous self and world. The rigid and insensitive application of such categories tends to level the unique potential of creative and discerning individuals in favor of general and predetermined social purposes. Strict application of categories mutes the tuning or attunement process while disowning the virtues of qualitative experience. This suggests loss for both the individual and the group. Intelligently directing and forming a student's habits of acting, thinking, and being affected require the direct detection of what there is to be perceived in the way of native impulses.

John Dewey (1916) describes a variation of the rationalist or top-down, hierarchical approach.

> There is a concept of education which professes to be based on the idea of development. But it takes back with one hand what it proffers with the other. Development is not conceived as continuous growing, but as the unfolding of latent powers toward definite goal. The goal is conceived of as completion, perfection. Life at any stage short of attainment of this goal is merely an unfolding toward it. (p. 56)

Although this approach, Dewey argues, praises the virtues of development, process, and progress, learning is a mere means to a separate and more valued, static end. Developmental processes are "conceived to be merely transitional; they lack meaning on their own account" (p. 57). That is to say, they "possess significance only as movements *toward* something away from what is going on now" (p. 57). Present experience is regulated by a hypothetical and abstract and indefinite future state. Although this

approach explicitly emphasizes the dynamics of learning, the static qualities of experience are its fundamental assumption.

Insofar as the goal is that of perfection, the standard of development is always at an unattainable distance. Hence, the goal lies beyond what perceptual information can distinctly specify. The learning situation can consequently operate according to the, possibly, uninformed or poorly informed assumptions of rationalist educators. There must be some way to distinguish the proper unfolding of a student's mind from other things that they may say or do. Dewey (1916) writes:

> Consequently, by "suggestive questioning" or some other pedagogical device, the teacher proceeds to draw out from the pupil what is desired. If what is desired is obtained, that is evidence that the child is unfolding properly. *But as the pupil generally has no initiative of his own in this direction, the result is random groping after what is wanted, and the formation of habits of dependence upon cues furnished by others.* (p. 57, italics added)

This approach, according to Chapter 5, encourages the student to be compliant or oversensitive and overresponsive and the teacher to be insensitive and unresponsive to the needs, abilities, and interests of the student. A rigidly structured and deterministic learning situation cannot facilitate the emergence of truly autonomous agency. In principle the student's options are either rigid conformity or complete rebellion. The teacher's complementary options are either retaliation or caving in. An implicit aim is for the student to learn how to *follow* explicit directions and orders. The teacher functions largely as an authoritarian figure who makes categorical demands upon the students. No one, I suppose, doubts that this approach has its virtues, but developing a capacity for autonomous growth cannot be one of them. Since the student's own unique perspective, capacities, and desires are not engaged or developed, the student learns an immature or primitive level of responsibility. A mature level of psychic organization or developmental unity is not required. Chapter 5 refers to this as *holding* oneself responsible. Dewey explains that the idea of the "continued capacity for growth" "cannot be applied to *all*

members of a society except where the intercourse of man with man is mutual" (p. 100). Notice the concept of mutuality. Benjamin (1988) is used to develop this idea in Chapter 5. Mutuality implies intersubjectivity, a concept that rationalist autonomy excludes. The development of agency and socially acceptable desires requires a learning environment with both structure and freedom.

When taken seriously by educators, the rationalist approach can lead to the sorts of practices that Bennett (1999) prescribes in her teacher education text. A claim she draws our attention to is that "field independent" learners are more analytic, more independent, prefer inquiry-based teaching styles, and are more apt to pursue mathemathics and science than do "field dependent" learners. The latter are more intuitive, more responsive to social and extrinsic reinforcers, and not as interested in pursuing fields demanding critical rigor (e.g., public relations, marketing, elementary education). What makes this approach top-down and "rationalist" is that an abstract, general trait is presumed to determine the structure and content of experience. This sharply contrasts with the ecological approach where experience is determined by what there is in the world to perceive and act upon. Further, rationalists assume that differences in what persons perceive and understand are a function of how they internally process and interpret information. And so the reason that field dependent learners have trouble comprehending mathematical truths is because they lack a general logical thinking capacity. This is also how Piagetians account for differences in children's ability to conserve volume across a shape transformation. The problem with this approach is that it begs the origin question, namely, how anything new or unexpected can enter the system. A fundamental assumption is that one must have a proclivity for mathematics as a precondition for its understanding. Learning is thus a progressive unfolding of what one already knows. Taken seriously, this assumption greatly diminishes what education and schooling can conceivably accomplish since it rules against instruction having a decisive effect on one's interests, abilities, and level of development. In the case of mathematics, it assumes that

one's experience of number in various contexts is a mere effect and not a generator of mathematical interest and competence.

For the empiricist, experience-based learning is reducible to mechanical-response learning or unintelligent habit-formation, and meaning is a matter of forming *arbitrary* or non-functional associations stored as such in memory. The undeveloped mind or individual is a *tabula rasa* or blank slate awaiting the inscriptions of parents and teachers. The individual is simply a function of environmental influences. Because of the supposedly unlimited malleability of the individual, society in principle can construct individuals according to an unlimited variety of socially predetermined purposes. Also, there is no reason to worry about violating the integrity of an individual because there are no native tendencies or preferences that ought to be honored. This is the bottom-up, hierarchical concept of intellectual and character development that cannot comprehend autonomy and personal responsibility. B. F. Skinner (1972) notes approvingly that

> it was Robert Owen, according to Trevelyan, who first "clearly grasped and taught that the environment makes character and that the environment is under human control" or, as Gilbert Seldes wrote, "that man is a creature of circumstance, that if you changed the environments of thirty little Hottentots and thirty little aristocratic children, the aristocrats would become Hottentots, for all practical purposes, and the Hottentots little conservatives." (p.175)

Because responding, for Skinner, can be predicted and controlled by manipulating environmental contingencies, references to states of mind, what individuals perceive and understand and what an act means for an actor, are superfluous. For example, in Watson and Raynor's classic experiment, the infant Albert experienced a loud noxious noise paired with a white rat to which he had previously been accommodated. As a result of that experience, he subsequently displayed anxious behaviors—wimpering and withdrawal—when the rat was presented without the noise. Given the logic of operationalism, it can be said that Albert acquired a fear of the white rat given that the fear is defined as *wimpers and withdraws when a white rat appears*. This begs key

questions that educational practice ought not to ignore. The first concerns instructional aims, namely, should Albert be made wary of rats? An ecological and functional justification for that would be that rats can cause harm by spreading disease, eating one's food, or chewing the electrical wiring in one's house. To learn those negative affordances entails becoming knowledgeable about the *ordinary* reality of rodents. But that is not what Albert learned from his instruction. His fear, his wariness, is based on the arbitrary or non-functional association between the rat and the unconditioned or unlearned stimulus that the experimenters put together. Albert's irrational fear and inappropriate response imply an episode of disrupted intentionality. And insofar as Albert experiences the rat as the source of danger or discomforting noise, he *suffers* the effect of his own disorganized psychic activity. It was the experimenters who frightened him. This approach confuses deception with education. Ecologically minded teachers have a second concern about this situation; namely, the intentional content of Albert's anxiety. This is not an issue for reductive psychological theories that treat persons as objects and isolate learning from function. What counts is the rigid and narrow control of behavior, not its subjective meaning.

The hostility to ecological considerations is evident, too, in behaviorists' recommendations for motivating learning. Skinner (1984) recognizes that the tradition of punishing students for not studying is flawed because it generates negative attitudes toward the subject matter and teacher. But he faults progressive educators for supposing that students can be intrinsically motivated by what they are learning.

> The great mistake of progressive education was to try to replace [punitive sanctions] with natural curiosity. Teachers were to bring the real world into the classroom to arouse the students' interest. The inevitable result was a neglect of subjects in which children were not interested. . . . One solution is to make some of the reinforcers—goods or privileges—artificially contingent upon basic behavior, as in a token economy. (pp. 951-952)

The problem with Skinner's "solution" is that it licenses students learning to achieve and perform without comprehending the ecological or functional value of what they are learning. This can be done, of course, but persons are handled as nonintentional motor systems or servo-mechanisms. Learning to do something in isolation from its practical purpose or value undermines *curiosity*, understanding, memory, and transfer of the skill to novel, uninstructed situations (where the contrived reinforcement contingency is not operative). Learning that is motivated by punishment and reward ensures that learning is merely a means to a separate end. This separates individual actions from any intelligent connection to the common goals of the group. Since the unique potential of an individual is neither acknowledged, directed, nor developed, the individual is denied (at least in the school) the sense of self-satisfaction and well-being that is obtained in performing well, and the group may be denied the services of a satisfied and (perhaps highly) skilled individual.

Democracy may be denied an independently thinking participant. Because individual differences and the student's personal sense of purpose are not taken into account, habit formation cannot be *intelligently* directed. Dewey (1916) describes the outcome when he says that "routine" habits "possess us, rather than we them. They move us; they control us" (p. 29). Because the behavioristic approach to learning is hostile to mutuality and proceeds according to punishment and reward schedules, its lessons are a kind of internalized coercion. Habits that are not unified with the first person or subjective perspective (as I argued in Chapter 5) tend to leave one vulnerable to episodes of disrupted intentionality. Behaviorism teaches only a lower level of psychic organization and responsibility, that is of *holding* oneself responsible for one's impulses. In such a learning situation the teacher is an authority figure, but only by means of a mechanistic and authoritarian methodology and learning situation. In school, the student learns to work exclusively for grades, and this kind of learning can be transferred to the workplace where workers work exclusively for a paycheck. The pursuit of interpersonal

relations is learned in a context of ongoing power struggles instead of mutuality. The relationship between a student and teacher is therefore analogous to an antagonistic kind of boss-employee relationship.

The ecological concept of autonomy and sociability are more consistent with *intelligent* participation in a democratic form of government. From the ecological perspective of this study or the developmental perspective of Chapter 5, sociability is intersubjectivity. Autonomy and intersubjectivity proceed only at a mature level of psychic organization. The well-developed or individuated character *accepts* responsibility for his or her own motivational states. Sufficiently developed motivational states are integrated with the conscious, first-person perspective and thus function according to a coherent, intelligent, and goal-oriented level of psychic organization. Such a mode and level of functioning implies that the demands of others do not conflict with internal demands and one is therefore free of intentionality disrupting episodes of super-I activity. Consciously directed action proceeds according to the clearly and distinctly understood demands of the ideal-I. The *integrity* of the individual is not threatened by the demands of intersubjective interpersonal relations. The individuated character is a unique locus of control and desire. Such an individual is neither the mere means to the ends of others, nor are others mere means to his or her ends. Intersubjective interpersonal interacting, like any kind of unimpeded activity, is an end in itself continuous with ends beyond itself. A sense of self-affirming well-being is produced in such performances. Individuated characters reciprocally afford one another their own subjectivity. That is to say, I am a means to another's subjectivity while another is a means to my subjectivity only if we both recognize one another as ends in ourselves. Independent thought and action are therefore possible for both of us. Interpersonal relations are not based on fixed or final agreements but are a process in which participation is an end in itself. Such a *holistic* form of instrumentalism could be the interpersonal foundation for dynamic democratic processes that never come to static and final solutions but proceed on the presupposition

that participation in the process is an end in itself that is continuous and consistent with ends beyond the immediate process.

Some traditionally oriented critics would argue that the mutuality required for the above dynamic form of democracy is an unrealistic dream because we are innately disposed or hard-wired for hierarchically organized social institutions. Individuals are said to be hard-wired for a specific range of functioning and learning on the intelligence hierarchy. Thinking resides on the top and doing on the bottom. Because the actual structure of social institutions has emerged from social and education practices that are patterned after traditional means-end dichotomies and dichotomies between distinct kinds of knowing and learning, they tend to produce the illusion of their own necessity. The ideal of different kinds of knowing can produce the illusion of different kinds of knowing insofar as social institutions are structured according to the ideal. The illusion is produced and maintained by keeping theoretically skilled people separate from those skilled in practical matters. Because one group lacks significant experience of what the other group does, commonly accepted beliefs about the reality that is said to underlie such structures *seems* to be empirically confirmed. Divisions of learning and labor very effectively limit and control the kinds of experience that people can have. Theoretically, the ideal is based on the assumption that learning and knowing are either top-down, intellectually regulated, hierarchical processes or bottom-up, hierarchical processes that are regulated by sensory experience.

Recall that from Turvey's (1977, 1990) ecologically oriented theoretical perspective, we discovered why learning and knowing are neither top-down nor bottom-up hierarchical processes. That is to say, Chapter 4 explains why learning is not the modification of the behavior of an extra-systematically organized or unthinking motor system through either the environment (bottom-up) or through the intellect or fixed executive center (top-down), but the progressive, environmentally informed and goal-directed reorganization of an autonomous, self-organizing action and perception system.

New forms of organization thereby make new or improved abilities possible. According to the argument of this study, uncoordinated or poorly coordinated physical and psychic functioning produces the mere appearance or, perhaps, illusion of an externally or hierarchically organized motor-system. The traditional concept of a hierarchically organized, sensory controlled motor-system describes the minimum limit of human coordination, whereas the concept of a flexibly organized cognitive heterarchy (in which intelligence flexibly operates at levels specified by the intended goal) describes the maximum limit of human coordination. Functionally organized intelligence is therefore concentrated at a number of distinct levels, or, more precisely, the location of the executive center in a well-coordinated or dexterous activity is determined by and changes as the goal of an action changes. The executive center cannot be reduced to an anatomically specific location, except, perhaps during a brief moment of disrupted activity. Its place in the CNS is never genuinely fixed but flexibly and functionally specified. Perception rather than resemblance-based psychological construction processes control action and is therefore the true basis of learning. Epistemological justifications for undemocratic social hierarchies and corresponding divisions of labor that either privilege experience and action at the expense of reflective thought processes or privilege reflective thought at the expense of experience and action are seriously undermined.

For the ecological approach to learning, the world of qualitative experience is a self-sufficient and reliable source of information that specifies persisting and meaningful invariant meaning structures; it does not need supplemental and corrective intellectual construction processes in order to be a trustworthy source of enduring truths and values. Of course, good teaching methods can make the learning process much more efficient and safer, too. But the use and influence of reductive psychological theories of learning and instruction can eclipse the significance of a particular subject matter. The problem is that such theories can obscure the student's and the teacher's perception of what is being studied. Associationist theories of mind assume that perceiving is what happens at the

beginning of a learning process and knowing or learning are the end result or the only intelligently structured part of that process (though, I have argued, not unequivocally grounded in it.) Like Descartes, the contemporary associationist assumes that perceiving is unintelligent while arguing that learning or knowing is a function of timeless concepts and categories. The most basic assumption is that invariant meaning and structure must be projected upon otherwise unstructured and meaningless objects of experience by means of an association-forming and concept-storing mind. A complementary assumption is that there are generic learning processes that are reducible to psychological processes. Psychological generalizations are therefore assumed to be more basic for learning than the diverse and inexhaustible wealth of the world of qualitative experience. Learning is about the mind rather than perceptually controlled exploratory action. Insofar as these general assumptions are practiced, the content and organization of subject matter is determined by traditional psychological principles of learning. According to the ecological approach, the subject matter itself may imply very different forms of organization and selection of content.

The ecological approach insists that different subjects of study or research have their own directly perceivable and subject specific, invariant meaning-structures that are *distinctly* detected only by means of the systematic tuning of the senses and action structures. Learning therefore cannot be well understood in terms of general mental or psychological processes. *According to the ecological approach, perceiving is itself a kind of thinking or intelligent activity.* "Our reasons for supposing that seeing is something quite unlike knowing something," Gibson (1979) says, "come from the old doctrine that seeing is having temporary sensations one after another at the passing moment of present time, whereas knowing is having permanent concepts stored in memory" (p. 258). According to Gibson and the ecological approach, "knowing is an *extension* of perceiving" (p. 258). Learning is therefore an extension of and continuous with perceiving. The two are not distinct *kinds* of cognition. Marjorie Grene (1993) says that

"*awareness of persisting structure describes equally the child's recognition of a kitten and the physicist's recognition of a muon or a pion; the extracting and abstracting of invariants are equally a characteristics of both cases*" (p. 115, italics added). Learning in *any* area of study is a process of becoming attuned to persisting and invariant structures. This applies equally to the world of ordinary experience and of abstract mathematical cognition. Gibson (1979) writes:

> The child becomes aware of the world by looking around and looking at, by listening, feeling, smelling, and tasting, but then she begins to be *made* aware of the world as well. She is shown things, and told things, and given models and pictures of things, and then instruments and tools and books, and finally rules and short cuts for finding out more things. Toys, pictures, and words are aids to perceiving, provided by parents and teachers. They transmit to the next generation the tricks of the human trade. The labors of the first perceivers are spared their descendants. The extracting and abstracting of the invariants that specify the environment are made vastly easier with these aids to comprehension. But they are not in themselves knowledge, as we are tempted to think. All they can do is facilitate knowing by the young.
>
> These extended or aided modes of apprehension are all cases of information pickup from a stimulus flux. The learner has to hear the speech in order to pick up the message; to see the model, the picture, or the writing; to manipulate the instrument in order to extract the information. But the information itself is largely independent of the stimulus flux. (p. 258)

The information that specifies an invariant meaning-structure is independent of the stimulus flux or material medium in which it is delivered. For instance, the meaning of a sentence may be the same whether it is written or spoken. Recall Turvey's (1977) letter A writing task from the discussion in Chapter 4. The same is true for larger units of meaning. A sentence may be handwritten in cursive or printed form according to unlimited variations in style. In spite of such variability, we are able to reliably detect and construct the same meaning. Meaning can also be preserved in spite of unlimited variations of material and form. The same message can be conveyed on a computer screen, printed by a machine on paper, plastic, or glass, or etched in stone.

The problem comes when the medium itself or its uncoordinated or unskilled use impedes fluent communication or functioning. This is to be expected insofar as one is unskilled in the use of a cultural or scientific instrument. Of course, psychological theories and concepts are also implicated. They become extensions of our own action and perception systems insofar as we incorporate what they afford into our own cognitive activity. As coordination develops, a persisting balance between the static (posture) and dynamic (locomotion) components of experience is formed. Recall Leder (1990) from Chapter 1 who argues that the acquisition of written and spoken language "both involve effacement of the body of the sign and the body of the subject engaged with the language" (p. 123). As we acquire a language, a skill of any kind, or coordination in the use of any kind of instrument or activity, its form and matter disappear from the field of action and perception. That is to say, as we learn a language, we progressively pay less attention to isolated words and rules of grammar, and progressively become more attuned to the invariant meaning-structures that we detect (perception) or construct (action). Listening, reading, speaking, and writing skills become more fluent. Habit formation affords this shift in attention and the progressive disappearance of the instrument from the cognitive field. Put differently, instruments of all kinds acquire self-effacing transitivity as they become a coordinated extension of one's own activity. One has formed an intelligently structured habit.

When traditional theories of learning reduce learning to developing awareness of associations formed among isolated, momentary sensory qualities and timeless conceptual form stored in memory, they capture the mode of attention or orientation of an unskilled or impeded performance. From such a perspective there is an unbalanced emphasis on the static or postural pole of experience while attention is drawn inward away from its functional orientation. The static or timeless concepts of traditional psychology thereby tend to conceal the things that it should reveal. Learning theory can become the primary object of study and become an isolated object of knowledge and

primary object of study. When learning theories and implied procedures, principles, and institutions are assumed to be the forms of knowledge, they can impair one's common-sense orientation or natural attitude. Although extended modes of comprehension, aids to comprehension, or intellectual instruments must themselves be learned in order to be used, they are not in themselves the object or end of learning. Their purpose is for extracting and abstracting invariant information that lies beyond themselves. Ecological psychology therefore signifies an improvement in our theoretical skills insofar as it extends our capacities for detecting the true invariant structures of learning.

The ecological approach implies that effective learning is based on the direct perception of good examples. Good examples specify broad equivalence classes of particular kinds of actions and perceptions. A particularly good example manifests a higher order form of invariant information that specifies a higher order invariant combination of variables or a complex, well organized, and functional combination of qualities. Recall that in Chapter 4 Shaw and Pittenger (1977) conceive of such invariant-structures in terms of geometry of *living* space or "*information* space" (p. 107). Such invariants are referred to as topological and cannot be reduced to quantitative or metric properties and hence must be qualitatively specified. The most concrete and least complex invariants belong to the geometry of the most abstract space, whereas the most abstract and complex invariants belong to the geometry of the most concrete or qualitative space. Contrary to traditional assumptions, the most sophisticated and highest order abstractions are derived from the world of qualitative experience. Such invariants are so abstract that they are *invisible*. True intellectual autonomy and learning therefore cannot be a matter of withdrawing from the world of qualitative experience and immersing one's thoughts in the world of abstract intellectual activity. First, there is no such world except in reflective thought. Second, there is nothing to reflect on without abstractions that originate in the qualitative world. Autonomous intellectual functioning

must emerge from the complexity of the world of functional combinations of qualities and are grasped from the perspective of the natural attitude or common-sense orientation.

An intelligently selected example can be generalized to a wide range of resembling situations. The universal is implied in a good particular. Insofar as an invariant is of a higher order, it contains information that specifies a wide class or set of lawful transformations. In other words, higher order and more complex forms of invariant information specify a broader range of lawful transformations than do lower order and less complex forms of invariant information. So, in principle, the highest order examples imply the largest and most complex set of interconnected meanings. As meaningful connections are multiplied, possibilities for reliable memory and comprehension improve. A directly perceived example is thus the most secure basis for learning general principles and reliable memory. As a general rule, then, teachers should use good examples in order to make abstract principles more memorable and more easily understood. This suggests that deductive or demonstrative forms of reasoning make more sense against a background or context of concrete activity. The use of good, representative examples for instruction tend to reduce the need for rote learning or repetitive drilling of isolated facts and principles. A student has a better chance to see how abstractions emerge or are abstracted from the context of lived experience. As a general principle, good memory is promoted to the extent that learning is based on a rich multiplicity of interconnected meanings.

The traditional and ecological concepts of the mind or individual imply distinct approaches to how any subject is taught. Consider history, for example: A rationalist approach implies, or at least suggests, that learning should be organized according to abstract themes and logical analyses. Students should study the rational explanations and justifications of various events. Teachers and researchers should demonstrate the overall or systematic coherence of events. The aim of the rationalist approach is the development of high level generalizations. An empiricist approach implies, or at least suggests, an

emphasis on memorization of isolated names, dates, events, and places. The explanation of events would be framed in terms of causally determined chronologies. The empiricist approach implies a search for causes at the level of particulars, whereas the rationalist approach implies a search for understanding at the general level. So there is a dichotomy between causal explanation and rational interpretation of events. The ecological approach that is developed in this study implies a reconceptualized synthesis of both approaches with an additional study of the principles of motivation of individuals and groups. A functional orientation is essential for the ecological perspective. Since history should emphasize the many interconnected meanings of concrete or qualitative experience, the narrative style is also essential. The rich illustration of events in literary or narrative style supports both memory and understanding. It is easier to remember and understand truly meaningful events. An emphasis on interpersonal situations can be especially helpful. Remembering abstract themes and abstract chronologies is much more difficult. Without the traditional dichotomy between reasons and causes, history does not need to be framed in mutually exclusive terms of either psychologically determined reasons or physically determined causes.

The action and perception system concept implies that reasons or intentions emerge from a context of cultural and natural law. A holistic and comprehensive approach is recommended. The concept of the emotional and motivational system presented in Chapter 5 implies that understanding actions and events is not possible exclusively at the abstract and formal level of reasoning. Interpretation must include various levels of rational and nonrational forms of motivation and explanation. Because the literary approach places historical figures in an imaginary context of action, interpersonal relations, and historically significant events, it affords the student an opportunity to identify with those figures. Being able to see things, at least in imagination, from the perspective of the historical figure promotes memory and understanding. One is thereby able to imagine what such events might mean for oneself.

By inverting the functional relation between memory and perception, associationist concepts of learning reduce history to abstract themes and chronologies that are stripped of the interconnected meanings that make actions and events interesting, memorable, and understandable.

In his book, *Why Johnny Can't Add*, Morris Kline's (1973) philosophy of elementary mathematics instruction clearly demonstrates a contrast between reductive and ecological or functional approaches to mathematics curriculum. The "traditional curriculum" is based on associationist or traditional empiricist assumptions. Although algebra is itself treated as a "continuing accumulation of logical development" (p. 178), learning it is a "mechanical process that forces students to rely upon memorization rather than understanding" (p. 6). The emphasis is on "drill" without the "rationale" of various processes. (p. 6). The logical organization of the material is taken for granted but never explained. Various topics are presented as if they are unrelated. "They are like the pages torn from a hundred different books, no one of which conveys the life, meaning and spirit of mathematics" (p.7). Students must learn to "imitate" visually presented mathematical procedures and processes. Kline says that "on the whole traditional curriculum does not pay much attention to understanding. It relies upon drill to get students to do the process readily" (p.6). From repetitive, "rote" learning, an understanding of the material is supposed to eventually emerge. That is to say, intelligence should eventually emerge from unintelligently formed habits. It seems that rational interpretation must emerge from mechanical, causal relations. If a student does learn to understand and remember the material, little—if any—credit should be given to the learning theory or the organization of the subject. In contrast to the ecological approach, memory is assumed to be the basis of learning and perception.

Because the traditional approach was shown to be quite ineffective, Kline (1973) explains, the "new mathematics" or "modern mathematics" approach was developed (p. 21). This is a top-down or purely deductive approach to mathematics and arises from a

rationalist philosophy of mathematics instruction. Students are taught the "logical foundations" of mathematics in order to "cultivate understanding" (p. 51). Advocates of the deductive approach contend that "when the subject is taught logically, when the reasoning behind the steps is revealed, students will no longer have to rely upon rote learning. They will *understand* the mathematics" (p. 30). The subject matter is organized according to deductive, logical principles, and understanding is reduced to a grasp of such principles, a grasp that supposedly makes mathematics memorable. One begins with "definitions and axioms and proves conclusions, called theorems, deductively" (p. 31). Understanding mathematics is largely reduced to an understanding of rule-governed procedures. Each individual operation of a process is understood in terms of the rule that is used to justify it. Understand the rules and you understand mathematics. The meaning of a mathematical process resides in the rules and axioms that justify its various steps.

While the logical approach reforms the algebra, arithmetic, and trigonometry curriculum, it leaves geometry largely unchanged. Geometry has been taught deductively the whole time. In time algebra, trigonometry, and arithmetic are used to teach deductive reasoning as geometry is largely eliminated. Kline (1973) argues that the deductive approach does not "impart understanding of mathematics" (p. 40). Kline argues that it is misleading to present mathematics as a fully developed and perfected deductive system: The intuitive thought processes, judgment, and developmental or experimental processes that make mathematics possible are not evident in the presentation of polished proofs and a finished deductive system. It took countless hours and years of trial and error in conjunction with deductive thinking for the masters to develop such a system, and the final product simply lies beyond the immediate understanding of elementary mathematics students. The "final theorem and proof are far from original and natural thoughts" (p. 53). Consequently, students simply learn to memorize numerous proofs and theorems that they cannot understand. The learning strategy, then, is that of largely—if not entirely—unintelligent habit formation. The distinction between empiricist and rationalist

techniques thus collapses. The student becomes an empiricist or associationist by default. At least if intelligence does play a role, it is not because of the learning theory or curriculum.

Kline (1973) prescribes a functional approach that emphasizes perceptually controlled action. A problem shared by empiricist and rationalist approaches is that the use value of mathematics for particular students is usually not connected with the more general aims of mathematical learning and education. Kline argues that when learning is clearly connected to an interesting function or purpose, motivation, memory, and understanding are significantly improved. Intelligently organized habit formation requires learning to have interesting functional connections. This enhances the transfer of skills to novel and noninstructed situations, that is, the autonomous capacity for learning from experience based on prior learning. Traditional justifications that place the value of the subject wholly beyond the current learning situation will not do. Many students, Kline argues, are not interested in preparation for more mathematics or some future form of study or employment that requires mathematics. Such claims are typically obscure or ambiguous with reference to current study. Many students do not want to be scientists or engineers, while others who do may change their minds if they learn that mathematics is tedious, boring, and meaningless.

Students need to see good examples. Kline warns the reader that because many "so-called applications are pointless" and a "part of mathematics proper," they are not applications or examples that supply "insight into the very meaning of mathematics" (p. 14). A work problem such as the "ditch digger's dilemma" exemplifies Kline's idea of "pointless work": "One man can dig a ditch in two days and another in three days. How much time will be required if both men dig together?" (p. 12). Further, there are tank-filling problems for students with nothing to fill or mixture problems for students who have nothing to mix. After reviewing several pages of such problems, Kline draws a striking conclusion: "All these problems are hopelessly artificial and will not convince

anyone that algebra is useful" (p. 13). Such problems are not interesting for most students of elementary mathematics because they disclose little or nothing beyond mathematics itself. Mathematics proper is thereby the thematic object of awareness instead of a significant world that *functional* mathematics can disclose in quantitative terms. The "great significance of mathematics lies *outside* mathematics" (p. 80, italics added). The ecological approach to mathematics emphasizes the natural attitude or common-sense orientation to ourselves and the world. Action should be regulated neither by blind habit nor rule-governed procedures but controlled by perceptual information and executive intent. "The natural motivation of the study is real, largely physical problems. . . . For most people, including the great mathematicians, the richness and values that do attach to mathematics derive from its use in studying the real world" (p. 181). Concrete or immediately functional and individually valued learning is more readily achieved and transferred to novel and uninstructed situations than learning that is externally motivated and organized. Recall that Chapters 4 and 5 demonstrate the flexibility or plasticity of self-organized, goal-directed intelligence and the rigidity of non-functional or dysfunctional intelligence. In Chapter 5 it is shown that effective therapy must be based on a good self-interpretation that is supported by an understanding of the details of one's own developmental history. Individual functioning is thereby restored as control of action is shifted from self-referring and world-concealing or equivocating psychological states to perceptual information. Kline prescribes an analogous treatment for elementary mathematics curriculum.

The logical or deductive systems of mathematics are well-developed interpretations of long developmental processes that were based on goal-directed creativity and discovery. The relative perfection of the finished system would never have been achieved without the numerous errors and corrections that are characteristic of inductive or experimental processes. In other words, the deductive system is the product of a goal-directed process. Kline (1973) says that "utility determines the logical approach

rather than the other way around" (p. 57). The "uses to which mathematics is put must be known to construct the logical foundations" (p. 52). Consider an analogy with chess:

> To play the game it is not sufficient to know the rules for moving the pieces. With just this much knowledge one can see that the correct move has been made but one will not understand why one move has been made rather than another. The inner reason or strategy is not apparent. In the case of mathematics the inner reason is usage. (p. 52)

That is to say from the exclusive perspective of the rules, purposes are not apparent. Without motivation and a sense of purpose the rules are largely meaningless. At the most, the rules specify broad and unambiguously bounded equivalence classes of moves, logical steps, operations, or procedures. Goal-directed judgment selects the appropriate variant within the class. The "real decisions call for judgment, and this is entirely different from deductive reasoning which leaves no room for judgment" (p. 60). When instruction emphasizes what strictly follows from the rule, it does not facilitate students' sense of goal-directed mathematical judgment. Classroom skills are not readily transferred to more practical situations without further instruction. The autonomous capacity for learning from experience, based on past experience, is not developed by means of the approach. That is to say, the capacity for autonomous intellectual functioning is not taught. Insofar as the rules themselves, instead of function, are the thematic object of perception, activity is executed in an inefficient or uncoordinated manner. The rules alone cannot provide the coherent and unified sense of direction that a goal and perceptual information does. Attention must be directed outward, beyond oneself and the instrument of action that is used to extend upon or amplify one's efforts.

Kline emphasizes the primacy of the direct perception of subject matter. In the historical development of mathematics, concepts with more intuitive or directly perceivable meaning are accepted first and less intuitive meanings are accepted later but only when they are based on more intuitive evidence. Priority is given to concrete evidence. If the masters of mathematical history could not begin with highly abstract

concepts, students should not begin there either. Kline (1973) says that "the basic approach to all new subject matter should be intuitive" (p. 188). Intuitive "denotes a direct grasp of the idea, whether it be a concept or proof" (p. 188). Explaining further, Kline says, "Primarily one makes sense of mathematics through the senses, for, as Aristotle put it, there is nothing in the intellect that was not first in the senses" (p. 189). The learning of a mathematical concept and set of operations should begin with the observation of a corresponding concrete event, operation, or object. Apparatus of various kinds "can be used to demonstrate physical happenings from which mathematical results can be inferred" (p. 193). Learning should be exploratory and constructive not only in the laboratory but on paper as well.

> Mathematics should not be developed deductively but constructively. . . . The constructive approach means that students should do the building of the theorems and proofs. The student should be creating mathematics. Of course, he will actually be re-crating it with the aid of a teacher. He can be gotten to do this if he is allowed to think intuitively, but he cannot be expected to "discover" within the framework of logical development that is almost always a highly sophisticated and artificial reconstruction of the original creative work. The constructive approach ensures understanding and teaches independent, productive work. (p. 185)

Because traditional approaches impose a logical organization upon the curriculum and emphasize the memorization of many high-level abstractions instead of autonomous, exploratory action that leads to a more secure, memorable, and flexible understanding of fewer, more basic abstractions, they cannot facilitate continuing and autonomous intellectual growth beyond the classroom. Kline explains, "Mathematics instruction, old and new, has not been designed to teach people to think but to follow the leader" (p. 187). In contrast, the ecological approach implies forms of instruction that can teach people to think for themselves.

Recall Chapter 4 and the emphasis on world-disclosing power of alternative perspectives. This should illuminate and clarify the cognitive basis of Kline's "intuitive" and "constructive" mathematics. Instead of working with one particular set of symbols

and one particular sequence of inferences based on one set of rules and axioms in order to prove a particular theorem, one might do parallel proofs by means of several forms of representation. One should experiment with different visible forms in order to detect the higher order invariants that cannot be seen. In other words, by comparing similar ways of doing the same thing, one can learn to detect invariants that cannot be expressed in images, explicit rules, or principles. The comparative or experimental emphasis of the ecological approach gives the hands and the imagination more to work with. Attention will not be hypnotically fixed on one set of images or symbols but can be more dynamic and flexible. *This is a variation of exploratory movement.* This emphasis implies a shift in the balance between the static and dynamic components of cognition. This approach also implies improved memory. Distinct representations of a common idea are lawful transformations of the same invariant. One's grasp of the invariant can thereby be perceived in a broader and deeper context of interconnected meanings. As different approaches to the same thing are multiplied, so are the number of interconnected meanings or the richness of one's context of thought. Abstract forms of study can thus acquire some of the richness of qualitative experience.

Perception of the qualitative world requires exploratory movement for detecting information that specifies invariant structures. Roger Penrose, one of the world's leading theoretical physicists and mathematicians, maintains an essentially ecological philosophy of mathematics. His aim is to de-mystify the character of mathematical learning and knowing. Its origins, he is confident, are unmistakably qualitative. Penrose (1989) explains:

> The whole point of our mathematical heritage and training is that we do *not* bow down to the authority of some obscure rules that we can never hope to understand. We must *see*—at least in principle—that each step in an argument can be reduced to something simple and obvious. Mathematical truth is not a horrendously complicated dogma whose validity is beyond our comprehension. It is something built up from such simple and obvious

> ingredients—and when we comprehend them, their truth is clear and agreed by all. (p. 418)

A clear understanding of mathematics is not the exclusive right of a few well-born or privileged intellectual elites. A grasp of mathematic truth is afforded by practice or the progressive tuning of action and perceptual structures. Such truths are accessible to all who make the appropriate effort. Mathematics instruction is not necessarily an authoritarian form of social activity. Considered ecologically, it is consistent with mutuality and dynamic democratic processes.

While traditional reductive approaches assume that creative imagination and aesthetic sensitivity are antagonistic to objective cognition, the ecological approach implies that these three modes of cognition serve to complement and support one another. Institutionalized teaching practices, however, can produce the illusion or appearance of distinct faculties. Different modes of cognition are frequently emphasized or, perhaps, overemphasized in different courses of study. In English 101, students begin with a blank page and are given the task of writing coherent and interesting essays. Aesthetic and creative judgements are quite obviously essential. In elementary algebra or chemistry the rules, procedures, and outcomes are given in advance. An overwhelming sense of deterministic objectivity prevails. Because of widely varying practices, distinct modes of cognition can appear to be distinct and unrelated kinds of cognition. From the ecological perspective, the difference between such practices is more a matter of degree than kind. Creative and aesthetically oriented learning may begin with a smaller or less restrictive set of principles and a wider range of outcomes may be specified in advance. One must discover the aesthetic and creative criteria that are functional in a particular context. In creative work of any kind, one must learn to construct more of the necessary criteria or rules for oneself in order to produce functional results. That is to say, with a specific goal in mind, one must learn to determine the means for oneself. All construction processes must be perceptually informed. Because introductory science education generally

presents the rules and procedures (or means for producing results) as already given in final and fully developed form, it generally does not afford students secure development of such creative capacities.

On the one hand, artistic cognition learning benefits the scientist. On the other hand, objective cognition informs the artist about aesthetic values. Emphasizing the significance of aesthetics in mathematically oriented judgement, Penrose (1989) explains that

> aesthetic criteria are enormously valuable in forming our judgements. In the arts, one might say that it is aesthetic criteria that are paramount. Aesthetics in the arts is a sophisticated subject and philosophers have devoted lifetimes to its study. It could be argued that in mathematics and the sciences, such criteria are merely incidental, the criterion of truth being paramount. However, it seems to be impossible to separate one from the other when one considers the issues of inspiration and insight. My impression is that the strong conviction of the *validity* of a flash of inspiration (not 100 per cent reliable, I should add, but at least far more reliable than just chance) is very closely bound up with its aesthetic qualities. A beautiful idea has a much greater chance of being a correct idea than an ugly one. At least that has been my own experience, and similar sentiments have been expressed by others. (p. 421)

Recall that pleasurable or pleasing activities generally accompany world disclosive psychological and physiological states. Leder (1990) helps us to explore this in Chapter 1. Pleasure tends to promote transcendence, whereas pain shifts attention to oneself or tends to promote immanence. By implication, perception of a true or well-developed idea is accompanied by an aesthetically pleasing feeling, whereas a false or poorly developed idea is felt as aesthetically displeasing.

The developmental aspect of the ecological concept of mind is rich with implications for character education. Both traditional approaches suppose that character can be improved by breaking unwanted associations and forming new ones. New and more acceptable habits of acting and being affected are established either through rational conviction or by nonrational means such as punishment and reward. While both

approaches are effective in their limited ways, neither approach recognizes unconscious character or identity formation processes. In spite of dedicated teaching efforts that proceed according to the best techniques prescribed by rationalist or empiricist approaches to learning (or some combination of both), the dynamics of character or identity formation proceed according to principles of primary process activity. Although symbolic transformations can deceive conscious thought processes, primary process activity is informed by perception of higher order invariant forms of information that specify the unique forms of organization that identify other persons such as parents or teachers. This means that children, students, and people generally are disposed to do as influential others do in spite of repeated and explicit orders to do otherwise. The parent or teacher who tells a child or student "Do as I say, not as I do" is likely to be disappointed. Consequently, if parents and teachers want to develop good character in the young, they must set good examples in their own conduct. Setting a good example for others to follow can be a more powerful teaching technique than explicit rule-based instruction.

Of course, empiricist and rationalist approaches can be effective in their own way; persuasion and rational discourse can function to supplement more fundamental primary processes. Of course, we must avoid reductive assumptions. Moral philosophy can be an effective means of character development insofar as students are already well organized psychically and can understand formal philosophical reasoning. Again, concrete examples integrated in the context of action should be used in order to connect abstract moral arguments to live issues. The many interconnected meanings promote understanding and memory. Good examples can be derived from literature. The reader can actually identify with a character who must act in spite of difficult moral dilemmas or conflicts. Students can thereby acquire a holistic sense of what formal arguments are about and which ones are better, as well as how one might proceed in the face of conflict. Literature engages the imagination or primary process activity that constructs or forms

individual identity. Intelligently chosen examples can thus be an effective approach for forming strong and morally sound character.

Now let us consider the traditional division between the sciences and humanities. This division of subject matter recreates the Cartesian mind-body dichotomy in the enduring structures of educational institutions. The humanities are the home of subjectivity, relativity, and values, whereas the sciences offer value-neutral objectivity and truth. The general implication is that in the scientific arena things can be clearly and distinctly known and rationally controlled, whereas in the bewildering and obscure complexity of humanities or human sciences little--if anything--can be known or reliably controlled. There is no objective way to distinguish true and false claims. Anyone's opinion is as good as another's. There appear to be no objective rules or standards beyond one's own impulses. So anything goes. Although this kind of dualism cannot be justified epistemologically or cognitively (or at least this has been my argument), its dangerous implications should be taken seriously.

The educational environment of the unabomber should provide some interesting insights into some practical implications of the ideal of value-neutral, objective cognition. Alston Chase (2000), in his article, "Harvard and the making of the unabomber," argues that the science and humanities curriculum that has been common to many colleges and universities for some time now has created a "culture of despair" (p. 50). Chase tells us about the "general education" or "Gen Ed" curriculum that was "fully implemented by 1950" at Harvard University (p. 50). It "was part of a nationwide curricular reform that sought to inculcate a sense of 'shared values' among the undergraduates through instruction in the Judeo-Christian tradition" (p. 50). Chase explains:

> Required Gen Ed courses focused on science, literature, philosophy, history, and Western institutions. The undergraduate curriculum, therefore, was initially designed to be neatly divided into two categories, one general and one specialized, one emphasizing history and values, the other emphasizing value-free methodologies employed by scholars in

> various academic fields. This attempt at balance would give rise to a battle in the long war between humanism and positivism. (p. 50)

Chase also explains that the faculty was divided into warring factions, those who saw science and technology as a threat to Western values and human survival (i.e., nuclear weapons and warfare) and the majority or those who saw science as a "liberator from superstition and an avenue to progress. Both of these views found their way into the Gen Ed curriculum" (p. 50). The "dominant faction" had little sympathy for the value oriented approach (p. 50). "Rather than inculcate traditional values, they sought to undermine them. Soon 'Thou shalt not utter a value judgement' became a mantra for Harvard freshmen, in dorm bull sessions as well as in term papers. Positivism triumphed" (p. 50). Explaining further, Chase (2000) says,

> From the humanists we learned that science threatens civilization. From the scientists we learned that science cannot be stopped. Taken together, they implied that there was no hope. Gen Ed had created at Harvard a culture of despair. This culture of despair was not, of course, confined to Harvard--it was part of a more generalized phenomenon among intellectuals all over the Western world. (p. 50)

Chase's argument is that this culture of despair, of scientific objectivity and power, of religious irrationality, and of moral relativity played a significant role in creating the unabomber.

The foregoing reference is to Theodore Kaczynski, a Harvard graduate and brilliant mathematician, who conducted a "lethal campaign of terrorism" by means of letter bombs (Chase, 2000, p. 43). Kaczynski was dubbed "'the Unabomber' by the FBI because his early victims were associated with *un*iversities or *a*irlines" (p. 43). Chase argues that it

> was the confluence of two streams of development that transformed Ted Kaczynski into the unabomber. One stream was personal, fed by his anger toward his family and those he felt had slighted or hurt him, in high school and college. The other derived from his philosophical critique of society and its institutions, and reflected the culture of despair he encountered at Harvard and later. (p. 63)

Kaczynski also participated in extremely abusive psychological experiments at Harvard. These experiments, Chase says, "may have well fed both streams" (p. 63). In his manifesto Kaczynski argues that "continued scientific and technical progress will inevitably result in the extinction of individual liberty" (p. 64). For him, it "was imperative that this juggernaut be stopped" (p. 64). Kaczynski believed that he was waging a just war against the dehumanizing and destructive dangers of science, technology, and industry.

Chase (2000) quotes the manifesto: "The system does not and cannot exist to satisfy human needs.Instead, it is human nature that has to be modified to fit the needs of the system" (p. 43). People are forced to conform to the world of machines instead of using machines to serve human needs. What is particularly striking is that Kaczynski's views, Chase argues, are commonplace in Western culture. Chase (2000) explains that according to the unabomber manifesto, science, technology, and industry have been "a disaster for the human race" (p. 43). Chase says that the "manifesto was greeted in 1995 by many thoughtful people as a work of genius, or at least, profundity and quite sane" (p. 44). This evaluation, according to Chase, was changed to one of insanity only for purposes of Kaczynski's trial and perhaps to sooth the conscience of the most highly educated. Chase (2000) writes:

> It was true that many believed Kaczynski was insane because they needed to believe it. But the truly disturbing aspect of Kaczynski and his ideas is not that they are so foreign but that they are so familiar. The manifesto is a work of neither genius nor maniac. Except for its call to violence, the ideas it expresses are perfectly ordinary and unoriginal, shared by many Americans. Its pessimism over the direction of civilization and its rejection of the modern world are shared especially with the country's most highly educated. The manifesto is, in other words, an academic--and popular--cliché. And if concepts that many of us unreflectively accept can lead a person to commit serial murder, what does it say about us? We need to see Kaczynski as exceptional--madman or genius--because the alternative is so much more frightening. (p. 47)

Many of us, like the unabomber, may accept or be tempted to accept the dichotomy between value neutral objective forms of study and the lawless relativity of value-laden forms of study. One may also be confused and intimidated by the bewildering complexity of cultural and moral issues. The dualistic cognitive style of mathematical and scientific study may therefore be very appealing. Procedures that lead to unambiguously true or false answers provide the level of cognitive certainty that can ease one's anxiety about important questions. We also may recognize, like Kaczynski, that morality has no logical basis. The combination of value-neutral reasoning and the belief that human values are important but merely a matter of opinion can be a dangerous combination. Recall that from the ecological perspective, each subject matter has, to a significant extent, its own logic, reasoning, and forms of justification. It appears that Kaczynski may have assumed that the only invariant meaning-structures were the ones that he learned about through supposedly value free methodologies.

Chase (2000) elaborates on Kaczynski's possible thought process: "Embracing the value-neutral message of Harvard's position--morality was nonrational--made him feel free to murder" (p. 63). According to this conceptualization, values cannot be tested in a systematic or coherent manner. Values consequently regulate action but only unintelligently, unconsciously, and uncritically. A plausible conclusion is that the value-neutral message of positivism is alive and well and much more dangerous and destructive than we might have imagined. It was with the help of the general education curriculum that Kaczynski became "fixed on dualistic ideas of good and evil, and on a mathematical cognitive style that led him to think he could find absolute truth through the application of his own reason" (p. 43). Chase warns his readers that the "real story of Ted Kaczynski is one of the nature of modern evil--evil that results from the corrosive powers of intellect, and its arrogant tendency to put ideas above common humanity" (p. 64).

Perhaps Kaczynski is a particularly good example of Cartesian autonomy in practice, an example that even Descartes would find shocking. Recall that the Cartesian

concept of cognition and moral psychology implies that emotional stability and moral constancy are possible only insofar as action, emotion, and motivation conform to the timeless and abstract principles of purely intellectual reasoning processes. Recall also that this approach has no methods for handling frustration and the loss or separation from external goods; instead, we are told not to want things that lie beyond our control and not to reorganize or reform our desires but to *eliminate* them. Chapter 5 shows why this approach does not work. The ecological approach clearly implies that although general principles are important, particular problems must be encountered on their own terms. Perhaps, Kaczynski confused the instrument of knowing with the actual object or end of knowing. That is to say, he may have made the same mistake that Grene (1993) and Gibson (1979) warn us about. A method or instrument, improperly used, can serve to obscure or even conceal the true ends of knowing, learning, or associated methods. From the supposition of a lofty perspective one can lose sight of the concerns of particular persons. Surely such an orientation is more consistent with fascism than democracy. The unqualified or absolute principles of value-neutral methods and thinking must not be extended beyond their proper bounds. Intelligent action in the qualitative word demand properly qualified methods of knowing and learning.

GLOSSARY

Absence: During unimpeded or efficiently executed goal-direction action, awareness is directed away from the body and to the object of action and perception. The body is thereby absent from awareness. This condition or mode of bodily appearance is called bodily absence.

Affordance: This is a perceptually detected and meaningful or functional, invariant combination of variables or qualities. Such invariant meaning-structures provide opportunities for action, for good or ill. A substance may afford nutrition or poisoning. A surface may afford locomotion or a perilous fall.

Attunement or tuning processes: (1) Perceptual attunement or tuning entails a perceptual system becoming sensitive to previously undetected environmentally specific patterns of sensation. Receptors themselves become more sensitive. The attuned system *resonates* to information that specifies invariant structures (distinct from mechanisms that process information). (2) Tuning also refers to the autonomous adjustment of action structures to the unforeseen or unpredicted but perceived particulars of the context of action. The complementary tuning of the action system and the perceptual system results in improved perceptual control of action.

Coordinative structure: This is a functionally specified group of muscles. As the goal of an act changes, the organization of the group changes. A sufficient change in functioning specifies a distinct muscle group or structure. For example, throwing a ball overhand requires one coordinative structure while throwing it underhand requires another. The development of coordinative structures is a matter of habit formation.

Developmental unity: This term refers to the integration of primary process activity into secondary process forms of organization. As the process of unification or

integration proceeds, primary process thoughts achieve a goal-oriented form of organization. More complex and enduring forms of psychic organization are achieved. In other words, intrapsychic integration produces a persisting and higher level of developmental unity.

Disappearance: Like absence, this term refers to the self-effacing transitivity or functional transparency of the fully functioning organs of perception and action. As one becomes proficient at some activity or forms a habit, awareness progressively shifts away from the body and toward the intended goal. Awareness of the body or bodily presence progressively disappears.

Drive: This is an ambiguously structured and continuously flowing source of motivational energy that is univocally structured by cultural influences. While every human has a hunger or sex drive, a drive's goal-directed action pattern and the goal-object are culturally specified. That is to say, while eating habits and sexual preferences are native impulses that exhibit characteristics unique to individuals, they must be culturally structured or shaped in order to be fully functional. Whereas an instinctual pattern of behavior emerges largely from maturation, and, perhaps, without observing an example. Patterns specified by a drive take much longer to learn and intelligent direction is needed. Learning is both by example and formal instruction. A drive, therefore, specifies a much wider range of possibilities than an instinct.

Dys-appearance: This is a problematic awareness of the body or problematic presence of the body in one's field of action and perception. In the course of action, one might undergo an episode of pain, fatigue, or perform in an uncoordinated or clumsy manner. The body is said to dys-appear during such impeded or impaired performances.

Ecological: In this study ecological refers to an organism-environment mutuality and pertains to both physical and social environments. The operations of an ecologically oriented mind are coordinated with events in the environment. Action is controlled by

environmentally specific information (in contrast to physiological or psychological states that do not respond to such information).

Immanence: This means that awareness is directed toward one's own body or "here." As awareness shifts inward toward one's own body or "here," the world beyond oneself recedes from awareness. This is an introverted form of self-awareness.

Interpsychic: This term refers to mental activity between distinct minds or separate persons. Interpsychic transference means that a response appropriate to a particular person is projected onto another person or organism who functions as a symbolic substitute. Such transferences proceed according to superficial resemblances.

Intrapsychic: This term refers to the relation between primary and secondary mental activity or activity within the mind. For an unconscious thought to become conscious it must be interpreted in the appropriate terms or words whereby it is unified with goal-oriented conscious thought. This process is called intrapsychic transference.

Modes of bodily appearance or experience: Dys-appearance, disappearance, absence, presence, immanence, and transcendence are modes of bodily appearance. They are various modes of how we experience our own body. They correspond to various forms of self and other awareness.

Presence: This term means the opposite of absence. Presence is the mode of bodily appearance in which the body is present to awareness or present in the field of action and perception. Bodily presence implies that action is impeded and that the self-effacing transitivity of the sensorimotor surface is diminished or eliminated.

Primary process mental activity: These are unconscious thought processes. These thoughts are expressed largely in concrete images rather than concepts and are loosely associated with one another according to superficial resemblances. Contradictory images exist side by side. Such processes have no unified goal orientation.

Projection: Three senses are used in this study. (1) In the phenomenological sense, used by Leder (1990), projection is the direction of one's attention and awareness

outward or beyond one's sensorimotor surface during unimpeded action. One is aware of oneself as being in the world in contrast to being in one's body. (2) In the Gibsonian sense (1966, 1979), projection refers to light that is reflected off of environmental surfaces and into the ambient optic array. Such projections are described in geometrical terms and figures. (3). In the psychoanalytic sense used by Lear (1990), projection is a function of unconscious or primary process mental activity. The unconscious image of one person can be projected upon another person or animal. The projecting individual tends to respond to the image instead of information specifying another person. To be more technically precise, such projection is a form of interpsychic transference.

Secondary process mental activity: These are conscious thought processes and are expressed in a conceptual form of organization. Secondary process thought is also functional or goal-oriented.

Self-effacing transitivity: This is the functional transparency of the organs of perception and action. For example, with respect to visual perception, one sees an object beyond the eye but not the eye. In order to see well, the eye must be absent from the field of vision. One perceives from the eye and to the visual object.

Thematic object of awareness: Any object of focused attention or awareness. For example, when attending to the hand by looking at it (using the eyes) or by touching it (using one's other hand), one's hand is a thematic object of awareness. But when the hand is used to perceive the texture or temperature of a surface, the surface becomes the thematic object of attention, and the hand itself recedes from awareness or disappears.

Transcendence: As exploratory action or perception discloses a world beyond itself, awareness transcends one's own body. Awareness is directed "there" to what there is to perceive and act upon. The body is absent from awareness.

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BIOGRAPHICAL SKETCH

I was born in Rhode Island in 1954 and lived there for a year or two until my family moved to New Jersey. In 1960 we moved to Jacksonville, Florida, where I completed my primary and secondary schooling. Freehand drawing was the only thing I enjoyed and did well, partly because it provided an escape from boring and uninspiring lessons. The schools showed little or no interest in my art work, so in ninth grade I decided to go to trade school and subsequently did well in school for a change. From tenth grade until graduation I spent most of my time in auto shop classes. But upon graduation I had few ideas about how one might find a decent job and proceeded to work at various odd jobs. Since then, I have worked as a mechanic, truck driver, construction worker, factory worker, welder, laborer, heavy equipment operator, and also spent four years in the Army. Doubtful about my future without some kind of advanced education, I enrolled at the community college in Jacksonville. After earning a two-year degree there, I completed a B.A. degree at the University of Florida. My major was philosophy and my minor was English. Since then, I have studied more philosophy at the University of Florida both in the Philosophy Department and in the College of Education.

I certify that I have read this study and that in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation for the degree of Doctor of Philosophy.

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